

APRIL 1957

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SCIENCES

Contractors and Engineers

magazine of modern construction



Regrading a Texas farm road Page 6

How Gradalls built a \$2,000,000 business for Arnolt Brothers, Inc.



Gradall's ability to work under low ceilings is made use of in this ripping of Belgium Block paving from an approach to New York's Holland Tunnel.



Gradall economically spreads an even 3-inch layer of slag on an oil refinery's storage tank fire wall.



Gradall digs for a pipe run in one of the country's largest refineries. Its telescoping boom enables the operator to easily reach in under pipe bent.

"Our diversified contracts require equipment that can handle many different types of work. Multi-purpose Gradalls perform well on any project—and pay for themselves in 18 months or less", reports President Fred Arnolt, Jr.

Four years ago, when the principals of this small, but progressive dirt-moving organization decided to diversify their activities in order to prosper and grow, equipment selection became an important item.

A magazine advertisement for the multi-purpose Gradall gave them the idea of building their equipment fleet around one machine. As Vice President Marty Jessen tells the story, "The ad claimed that this machine would do 'a dozen' jobs. That was right up our alley. We took the gamble and it has paid off for us—time and time again."

In addition to its contracting business, Arnolt also rents equipment to other contractors. Most of these rentals have been from their fleet of 10 Gradalls. That's because users everywhere know of the machine's extreme versatility and ability to handle such a wide variety of work.

This year Arnolt's business in both the building and utility fields will total over \$2,000,000—and prospects look even better for 1957. Secret of their substantial growth can be attributed to the use of multi-purpose, mobile equipment—like the Gradall.

GRADALLS DO ALL THESE JOBS FOR ARNOLT BROTHERS, INC.

- Highway subgrade excavation
- Ditch cleaning
- Pipe placing
- Trench excavation
- Materials handling
- Pavement removal
- Frost breaking, for pipeline or trench
- Fine grading and slope dressing
- Backfilling
- Fire-bank construction
- Crane work and other lifting
- Pipe stringing
- Ditching
- Sheetpile driving

Distributors in over 75 principal cities
in the United States and Canada

Gradall
DIVISION OF

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PRECISION
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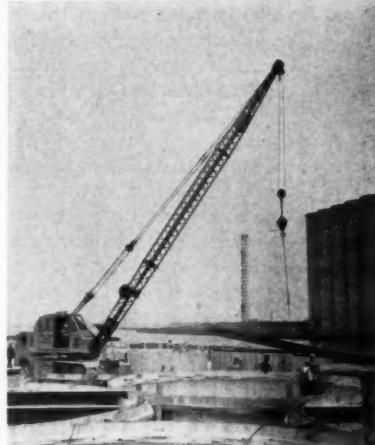
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Editorial

Teamwork or tug-of-war?

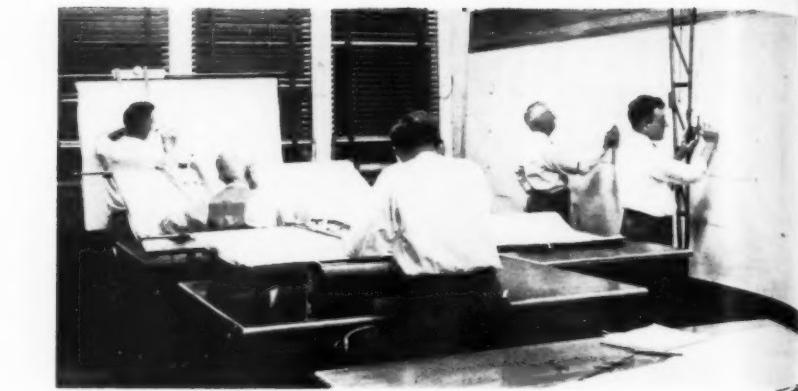
No emergency program is perfect. The fact that emergency measures are called for at all indicates a lack of preparation, of sufficient facilities to meet the demands of a situation at hand. And because emergency measures are always a substitute, allowances must be made for less than perfect efficiency of operation.

For state highway departments, the gigantic federal-aid highway program creates something of a crisis calling for emergency measures. Greatly increased demands on state engineering staffs come at a time when there is an acute shortage of engineering personnel. The big job is there to be done, however, and so the states must resort to emergency measures.

One of these emergency measures is the use of private engineering firms to augment the thin ranks of highway departments. Consulting firms have worked with highway departments on a modest scale for many years, but it has now become necessary to expand greatly their role in this field if the roads program is to move ahead.

Unfortunately, there are rumblings of dissatisfaction over this situation in some highway departments. Complaints are being aired that the consulting firms are unprepared for the tasks states are entrusting to them; that, whether through ignorance or carelessness, these firms are too often guilty of errors in calculation, classification, and specification; and that consultants' fees are out of proportion to state engineers' salaries.

All is not satisfactory from the consultants' viewpoint, either. Repre-



sentatives of these firms object to a state's interviewing several consultants and comparing their bids before hiring a firm (which they consider tantamount to taking bids on engineering work); to a failure to spell out in the contract the fee for any additional work; to the withholding of a percentage of the consultant's fee until the final phase of a project is completed; and to other practices.

What has happened as a result is that both highway departments and consulting firms often approach a project with prejudice, distrust, and a lack of cooperative spirit.

Perhaps one key to the problem lies in the fact that the consultant's role in state highway work is undergoing considerable change. Whereas the private engineering firm was formerly hired only to handle specialized work, i.e., certain types of bridges or other structures, which the state was unprepared to do, it is now being used to pad out the state's engineering force on a great deal of routine work.

States need to remember that the private engineering firm is a specialized outfit, and that its engineers need to be trained and carefully supervised when they undertake a new type of work. They need also to remember that the consultant's fee is not only the engineer's salary, but a part of the

firm's overhead and profits as well. The fee of a consulting engineer and the salary of a state engineer cannot equitably be compared.

On their part, consultants need to remember that roadbuilding is the field of the highway engineer, and that they can learn much from him. They need to recognize the problems that states have in conforming to strict specifications and working within a tight budget. And they need to respect the methods of state engineers as tried and proved sound.

It seems hardly necessary to remind both parties in this matter that only last year an ARBA Task Force reported to the federal government that "as a standby source of capacity, our consulting firms are capable of carrying substantial loads in the planning and design of the expanded program." For the highway departments, these words amount to a vote of confidence in the consultant; for the consultant, they amount to a challenge to be met.

Our advice to both parties is so fundamental as to be obvious. Each has a status which must be respected, each a capability which must be put to the fullest use. And only if both parties approach the job in a spirit of mutual respect and cooperation can the program be accomplished. To do less is to jeopardize our road program.

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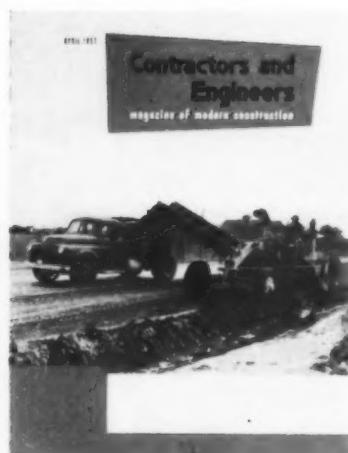
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CONTRACTORS AND ENGINEERS



On one of the many regrading, base, and surfacing jobs bringing farm roads in Texas to high standards, a Domor elevating grader attachment

on a Caterpillar No. 12 motor grader loads excess material from a ditch cut to a Dodge dump truck. The truck will haul to a point where fill is needed.

Page 6

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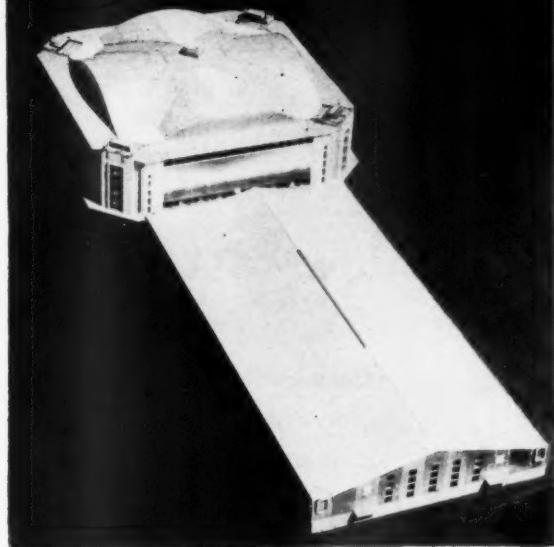
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Four barrel-shaped arches, resting on four towers, cover the post-free L. W. St. John Arena at Ohio State University. Each of the four towers contains ramps and stairways leading to the main concourse. In the foreground is the Thomas E. French field house.

Towers support barrel-shaped roofs of post-free sports arena



A unique roof, supported by arches resting on four towers on the diagonals of a square plan, provides an unobstructed view for 13,000 persons attending sports events at Ohio State University's L. W. St. John Arena. Designed by the organization of the Office of the University Architect under the direction of Howard D. Smith, the roof was fabricated and erected by Overly Mfg. Co. of Greensburg, Pa., and Los Angeles, Calif., at a construction cost of \$3,128,000. The building is of steel frame construction, with walls of stone and insulated metal panel facings. The roof expanse is 42,800 square feet.

The roof design presented some particularly difficult mechanical and layout problems. Four barrel-shaped roofs meet at a center point, with a 22-foot valley between, forming a groin vault construction. Since each barrel slopes to a low point at the front of each arch, no curves could be used.

Overly Type B batten type aluminum roofing with mechanical interlocking joints was applied over a metal deck that had two inches of rigid insulation sandwiched between two layers of 30-pound felt.

Roof construction

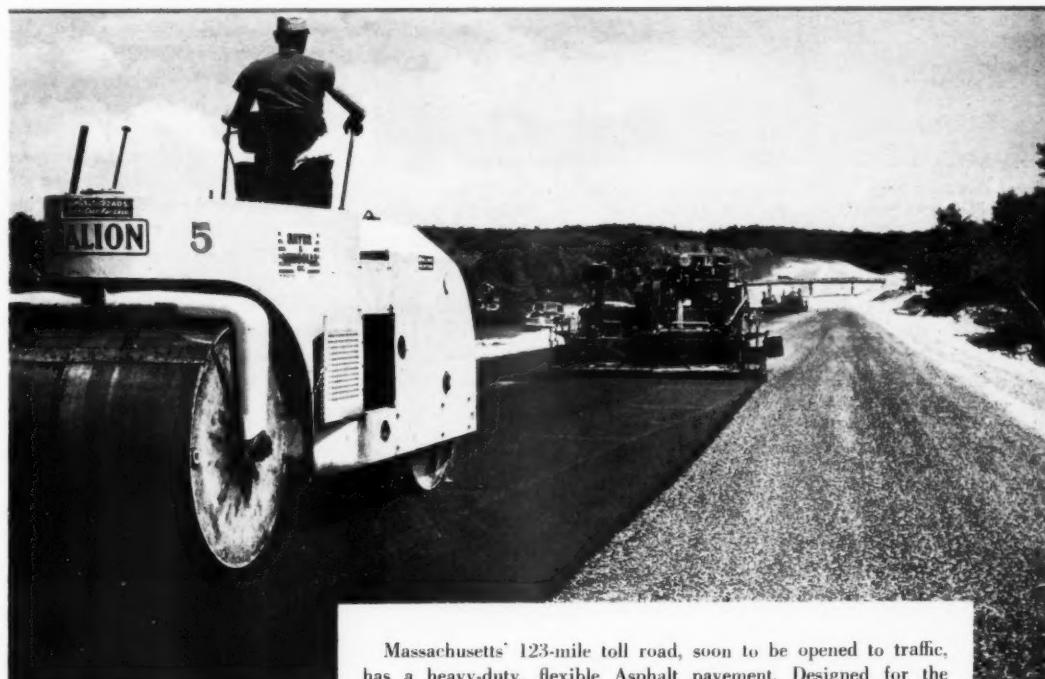
The four corner towers, facing each other at a 45-degree angle to the building's sides, lean inward a fraction of an inch to withstand the outward thrust of the steel trusses they support. Two parallel steel trusses, 28 feet apart, in each main arch, span 288 feet from tower to tower. These trusses form steel beam bridges 9 feet thick at the towers and tapering slightly at the span's peak elevation of 102 feet.

The post-free interior, of two-deck construction, has a seating capacity of 13,392. There are 9,400 seats on the first floor and the remainder are in the balcony. Of these, 11,780 are permanent theatre-type seats and 1,612 are located in three sections of roll-away bleachers—two sections along the side of the floor, and the third located at the end.

The four towers enclose the six ramps from the floor level to the main concourse, and the 16 stairways that lead from the main concourse to the balcony.

THE END

Heavy-duty Asphalt cuts cost of Massachusetts Turnpike



Massachusetts' 123-mile toll road, soon to be opened to traffic, has a heavy-duty, flexible Asphalt pavement. Designed for the heaviest traffic anticipated for this turnpike, Asphalt has saved millions of dollars in first cost, compared to other paving with the same load-carrying capacity.

CONTRACTOR—The Bayer & Minoglia Construction Company, Worcester, Mass.

The photograph shows a 3-inch hot-mix Texaco Asphaltic Concrete surface, constructed in two courses on 27 miles of the Massachusetts Turnpike. Supporting this surface are two 2½-inch layers of crushed stone, the upper one penetrated with asphalt cement by pressure distributor, the lower one sand-filled. Under this, there is a 12-inch gravel sub-base.

Texaco Asphalt products provide the road builder with answers to all his paving problems, whether he is building a heavy-duty pavement for a New England toll road, or a low-cost surface for a Wisconsin farm-to-market road. Helpful information on methods and materials recommended for all types of asphalt road and street construction is supplied in two booklets. Copies may be obtained without obligation by writing our nearest office.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 202

New techniques help reclaim low-cost farm roads

**Light emulsified asphalt treatment
halts raveling; lime stabilizes soft, wet
roadbed in irrigated areas**



Under small contracts let by the Land Service Road Division, the roads are regraded. Good compaction by this Cat D7 and Tampa double-drum sheepfoot roller keeps the need for high-type surfacing to a minimum.



Base course surfaces are protected with a light application of emulsified asphalt. Water in the material applied by the GMC tank truck will soak in or evaporate, leaving a tough coat of asphalt to hold fines in place and prevent raveling.



Another method used on these roads calls for lime to be used to correct soft spots in farming areas where irrigation facilities develop leaks. Excavated material will be built up in layers in the roddbed as lime is added.



This road, typical of local roads before being improved as part of the Farm Road system, has a narrow, deteriorated roadway and inadequate ditches grown with weeds and brush.

A new concept in highway design and construction has been developing in Texas since the State Highway Department set up its Land Service Road Division about ten years ago.

Contractors, and the engineers solely responsible for roads under this division, have joined together to develop new roadbuilding techniques and improve old ones, aiming always toward the construction of better roads at lower costs.

The roads involved in this setup are not the headline-making expressways or even the trunk highways, but local service roads that provide year-round all-weather service for adjoining rural areas. Two basic tenets—service to the land and low cost of construction and maintenance—govern the design and work on every road in this state-wide system.

Most of the roads are local feeder roads that lead from main highways, cities, and towns out into rural areas not served by the trunk highway system. These secondary highways, while commonly called Farm Roads, sometimes serve land being used for forestry, mining, or industry as well as agriculture.

The routes usually selected for inclusion in the Farm Road System are of such a low type of construction and so poorly maintained that they become impassable or very difficult to travel during wet seasons. As these roads are integrated into the state system, they are reconstructed to at least minimum all-weather standards so that they literally take thousands of rural residents "out of the mud."

In many cases, the roads wind through the country and follow



Small equipment like this D Tournapull is highly favored by the contractors doing the lighter type of work required on the Farm Road System. The windrowed excess material here is being hauled to a point where fill is needed.



Results of the program, as illustrated here, are evident throughout the state. The improved roads have wide, smooth surfaces, and shoulders are clear of weeds and brush.

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Sandy material, called subgrade treatment, is spread and shaped on one of the roads by a Cat No. 12 grader. This material, with a PI of about 9 to 12, is hauled from a pit near the job.

watercourses rather than cut across them. This keeps the amount of bridge construction to a minimum and holds down the over-all cost of the system.

The roads are designed to handle a traffic volume of 200 or more vehicles per day. Some routes are designed for and actually carry traffic volumes in excess of 5,000 vehicles per day.

Many bidders

As soon as roads are taken into the state system, they are regraded to improve their alignment, grade, and drainage. They are provided with a base strong enough to carry the anticipated traffic and are surfaced to a width of at least 20 feet. Emphasis is placed on the grading and base work during initial reconstruction. Future improvements, wherever necessary, can be made to include additional surface courses. The initial surfacing usually consists of a single or double asphalt penetration course.

The work on this system involves a large number of small to medium-size grading, base, and paving projects, together with drainage work and construction of a few bridges. These contracts have proved particularly popular with the smaller contractors, and it is not uncommon to find as many as 14 or 15 bidders on a job costing \$50,000 or less.

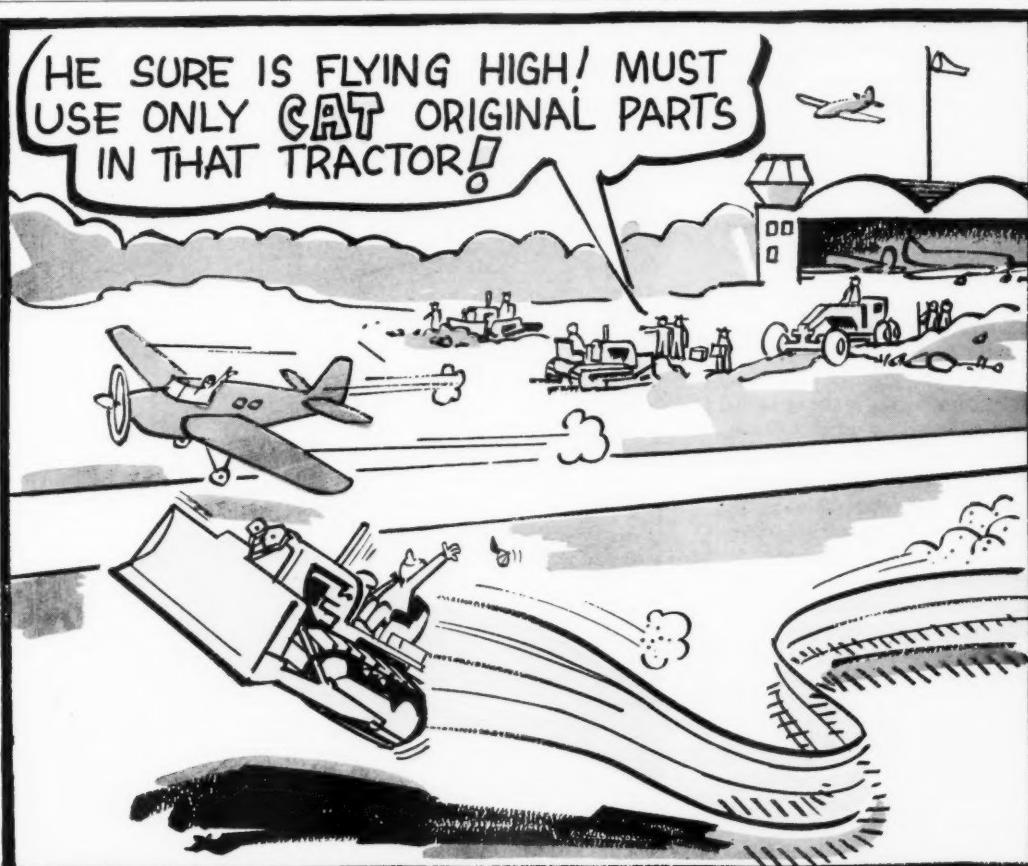
In a state as large as Texas, where soil, climate, and traffic vary greatly from one place to another, there can be no fixed pattern for improvements. In each area, an attempt is made to adapt the reconstruction to local needs and to use local materials so that costs are kept as low as possible.

In the arid Rio Grande Valley, for instance, moisture in the ground is an unimportant consideration. But in the areas where irrigation makes it possible to grow vegetables and citrus fruits, pockets of water often cause soft spots in the roadbeds. The water may come from leaking irrigation or drainage facilities, or simply from poor roadside drainage, but in all cases the areas have to be stabilized before the base and surfacing of the roadway can be placed.

Stabilize with lime

Typical of these conditions was a 3-mile job handled under a \$49,612 contract by E. B. Darby & Co., Inc., Pharr, Texas. This section of Farm Road 495 at the outskirts of McAllen covered a maze of irrigation facilities and the first job for the contractor was to find the uncharted pipes, siphons, drains, and similar installations. Another major problem was that of keeping the facilities in operation while the road was being reconstructed.

The first step in the job—to correct
(Continued on next page)

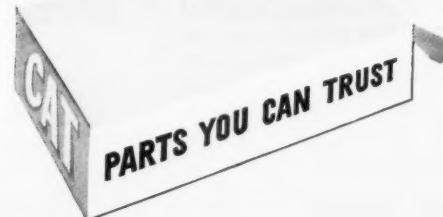


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(Continued from preceding page)

the leakage and protect the road in the future—was handled by replacing all the pipes in the roadway area with heavy reinforced pipe instead of the usual light irrigation pipe.

Areas that had been saturated were stabilized with lime. A Caterpillar D6 tractor and a Caterpillar 60 scraper excavated the wet material to a depth of 4 or 5 feet and spread the earth out on the nearby roadway while lime was added to the soil.

After the lime had been spread by hand in the bottom of the trench, a scraper brought some of the wet material back into the hole, spreading a thin layer of earth over the lime. This layer was kneaded and mixed by a sheepfoot roller that was pulled and pushed by a Caterpillar D7. The lime immediately absorbed much of the excess water, and the soil became crumbly instead of sticky. In this condition, it compacted quickly under the action of the sheepfoot.

When one layer had been compacted, the scraper brought in another lift of the wet material and the process was repeated. This continued until the grade had been built back up to the proper level. The addition of the lime did more than simply make the soil workable temporarily; it gave the earth a long-lasting stability and a resistance to softening under the effects of water.

The sheepfoot roller used by Darby in this operation was attached to the dozer frame at the front of the tractor instead of being attached to the tractor drawbar. This rigid front-end attachment made it possible for the tractor to push and pull the roller without having to turn around on the narrow road. The tractor operator, able to steer the sheepfoot to a reasonable degree as the tractor moved forward or backward, apparently had no difficulty at all in the operation.

Use caliche base

When this section of roadbed had been regraded, the irrigation facilities replaced, and the soft areas stabilized, a lift of subbase or roadbed treatment was placed. This consisted of material salvaged from the old roadbed, which was spread on the grade to a maximum depth of 6 inches and compacted.

The base course of 6 inches of caliche was obtained from deposits near the project. The caliche was crushed, trucked to the road, shaped by motor graders, watered, and rolled with a Ferguson 50-ton rubber-tire compactor pulled by a Caterpillar D7 tractor.

To obtain a surface as nearly perfect as possible the contractor had a No. 12 Caterpillar motor grader cut about a two-inch thickness of the base and reworked this material. Additional water was added whenever necessary to secure optimum conditions for compaction. The motor grader relaid the base to as smooth and perfect a grade as possible so that it could be rolled with a 3-wheel 10-ton Ingram roller.

Since it was usually not desirable to start the surfacing operations until



In the northeast section of the state, a joint-venture firm has an Allis-Chalmers HD-11 tractor pull a four-drum combination of Tampa sheepfoot rollers to compact the grade. A Caterpillar No. 12 motor grader is shaping up the section.

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the entire base course had been completed, it was necessary to maintain the surface of the base course under traffic for several days or longer. Without some form of protection, this base material would have raveled and dusted fines would have been lost, and the surface would have been pitted.

Seal with emulsified asphalt

To prevent such raveling, the contractor sealed the surface with a very light application of emulsified asphalt. The initial application was at

a rate of about 0.01 gallon per square yard; subsequent applications, when necessary, were at half that rate. These extremely light rates of application were obtained by mixing about 5 per cent of asphalt emulsion in a tank of water and spreading this mixture on the road with a gravity-feed water truck.

As the water soaked in or evaporated, a tough black film of asphalt remained on the surface of the base. There was no penetration of the asphalt, but the tough film on the surface prevented dusting and retarded

Grading on a new alignment changes a bad curve on this section of a road. As the Caterpillar No. 12 motor grader works along the road, scrapers pick up loads of earth to bring the section to grade.



Lubrication keeps jobs on schedule

TO MEET JOB DEADLINES, your equipment must deliver consistently smooth, dependable performance. That calls for really effective lubrication — *Texaco*. And here are some names to remember:

Texaco Marfak for chassis lubrication. World-famous for its ability to stay in the bearings, even under heavy shock loads. Protects parts against wear and rust for hundreds of extra miles.

Texaco Marfak Heavy Duty 2 for wheel bearing lubrication. Seals itself in, seals out dirt and mud for longer bearing life, more miles between repackings, safer braking. No seasonal change needed.

MORE THAN 650 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD.

Texaco Universal Gear Lubricant EP for smoother-working transmissions and differentials . . . *Texaco Track Roll Lubricant* for low-cost protection of crawler mechanisms.

Texaco Simplified Lubrication Plan for an easy way to handle all major lubrication with no more than six Texaco Lubricants. You avoid errors, save time and money. Get full details from a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

NEW MULTI-PURPOSE MARFAK

Texaco Marfak Heavy Duty Special 2 is specially designed for all grease-lubricated bearings. This lithium-base lubricant pumps easily and lubricates effectively even at low temperatures. It resists water, has a long service life.

raveling. If this surface showed any indication of raveling, the contractor simply applied another shot of emulsion.

Even when successive applications of the emulsion were required daily for a week or more, the cost was nominal. With the base maintained in the perfect condition in which it was finished, a light penetration surface treatment provides a very satisfactory riding surface.

The double-penetration surface treatment on this project consisted of two shots of OA-135 asphalt cement and two applications of pea gravel. The first shot of asphalt was applied at a rate of 0.2 gallon per square yard by an Etnyre distributor. Spreader trucks then placed ½-inch pea gravel at a rate of one cubic yard to 80 square yards of road surface. The pea gravel was broomed with a steel broom attachment on the blade of a Caterpillar No. 12 motor grader and rolled with Grace and Tampo pneumatic rollers and the Ingram steel-wheel roller.

The second application of asphalt was then made at a rate of 0.3 gallon per square yard, and ¼-inch pea gravel was applied at about half the rate of the first course. This course was broomed and rolled in the same way as the first.

On many of these jobs, Uvalde rock asphalt is used instead of the pea gravel. This material is a combination of limestone and asphalt which occurs in deposits in the San Antonio area. It is mined, crushed, and fluxed to produce the road-surfacing aggregate. When the rock asphalt is used, the applications of liquid asphalt are reduced to 0.12 gallon per square yard for the first application and 0.15 for the second. The aggregate is applied at a rate of one cubic yard to 40 square yards for the first application of ½-inch aggregate. The second course of ¾-inch material is put down at a rate of one cubic yard to 100 square yards.

Either of these types of surfacing produces a very serviceable mat that is inexpensive and can be built with a minimum amount of heavy equipment. The riding quality of the road depends to a large extent on the degree of perfection obtained in finishing the base course and maintaining

(Continued on next page)

Lubricants and Fuels FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 204

APRIL, 1957



In the Rio Grande Valley near McAllen, Texas, this Caterpillar No. 12 motor grader cores out the approach to a bridge so that an adequate base course can be put down.



THE EIMCO 105 EXCAVATOR LOADS MORE - FASTER.. CHEAPER

Eimco 105 Tractor-Excavators operate on a 10 to 12 second loading cycle. This speed can be maintained under ideal conditions.

Greater Capacity at 1/3 Initial Cost -
In tough conditions the 105 will out-perform other excavating equipment on a more impressive scale. It will pick up and discharge into the haulage unit much larger pieces of material than will go thru the bottom of a bucket on a boom shovel of equal (1½yd.) capacity. The 105 will exert greater digging force at the bucket lip than the larger, more expensive boom equipment - often eliminating blasting.

Equipment used around boom shovels such as bulldozers (for pushing up the broken rock) are eliminated with the Eimco 105 because this maneuverable tractor mounted excavator does its own bulldozing. Eimco 105's are rugged, heavy duty machines, built to stay working on the job. Proven overall operating and maintenance costs are 40% less than boom shovels of same bucket capacity. Independent final drives provide greater maneuverability. Up-front position for the operator gives him full visibility. There are many other advantages in the 105. Write for complete information.

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that finish until the surfacing is applied.

Lime stabilizes base

On another project in the Rio Grande Valley, lime was used to stabilize a portion of the base course. This was an 11.7-mile section of Farm Road 1015 near Weslaco, and the \$214,473 contract was handled by E. & M. Bohuskey Construction Co., Harlingen.

This former county road had a 16-foot-wide asphalt surface on a 7.5-inch base that was badly deteriorated. But all the old base material was salvaged and re-used with the addition of about one per cent of lime.

The old surfacing was scarified

with a Caterpillar ripper pulled by a Cat D8 tractor. The scarified material was walked with a sheepfoot roller and tractors to break up the larger chunks. The base material was then bladed to the side while incidental grading was completed and the subgrade compacted.

This subgrade treatment consisted of scarifying the surface to a width of about 28 feet with motor grader and Towner disks. The surface was then recompacted with Tampa sheepfoot rollers and a Bros 50-ton rubber-tire compactor.

The old base material was then pulled back onto the compacted subgrade and sack lime was added at a rate of 1 per cent of the volume of this material. The motor graders mixed the material on the road, bringing the dry materials back to a windrow at the center. This windrow was then split, and water was applied to the material, which was thoroughly mixed.

The motor graders then laid this material out in a single lift about 5 inches thick over a width of 22 feet. This course was compacted by the sheepfoot and 50-ton pneumatic rollers and finished off with a Tampa 9-wheel pneumatic roller pulled by a Minneapolis-Moline tractor.

A lift of new caliche base material was then added to bring the total depth of base to 9 inches. This was processed much the same as the initial base course, but lime was not added. The finished base was then sealed with asphalt emulsion to hold the base course intact until the surfacing could be applied.

Although the total cost of more than \$18,000 per mile on this project may not seem particularly low, a substantial part of that cost was absorbed in the adjustment and replacement of drainage and irrigation facilities. It is not unusual for these costs to run as high as \$10,000 per mile, which may be equal to or greater than the actual road construction costs.

A large contract

One of the biggest recent farm road contracts was a \$574,000 award to a joint venture of two contractors for the construction of 27.135 miles of road in Red River County in the northeast section of the state. The two contractors were R. B. Butler, Inc., Bryan, Texas, and J. H. Howard, Madisonville, Texas.

Most of this job followed the alignment of old roads, but some new alignment was made to correct bad curves. Since the right-of-way was widened to 120 feet, a great deal of clearing and grubbing of trees and brush along the old fence lines had to be done. Caterpillar D7 and D8 tractors handled these clearing and grubbing operations, the D7 being equipped with a Fleco root rake for handling brush and small trees.

The grading item, consisting of nearly 200,000 cubic yards of excavation, was handled by a spread made up of two Caterpillar D8 tractors with LeTourneau-Westinghouse LP

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scrapers, three Caterpillar DW15 scrapers, four Caterpillar No. 12 motor graders, and an Allis-Chalmers HD-11 tractor pulling a 4-unit Tampa sheepfoot roller.

These rigs shaped the section to a 40-foot top with flat shoulder slopes, a V-ditch, and full 3 to 1 backslopes. Compaction to 90 per cent standard Proctor density was obtained by the sheepfoot rollers, and the grade was finished by rolling with a Tampa 9-wheel pneumatic roller.

A 6-inch compacted course of sub-base, called roadbed treatment, was placed on the completed grade. This sand-clay material with a PI of about 9 to 12 was obtained from pits near the job. An Allis-Chalmers HD-5 Tracto-Shovel loaded the material from the pits to the hired dump trucks that hauled to the grade.

Four Chevrolet water trucks with 1,500-gallon tanks wet down the sub-base material as it was mixed and shaped by motor graders. Compaction was applied by the pneumatic rollers.

Since granular materials are very scarce in this area, the base course aggregates were trucked in from pits in Oklahoma. One of these was located at Hugo, 44 miles from the job, and the second was at Idabel, which meant a 22-mile haul.

A subcontractor, Lamar Equipment & Supply Co., Paris, Texas, hauled in the base materials with 20 Omaha Standard 10-cubic-yard bottom-dump trailers and from 15 to 30 dump trucks. Fifteen per cent of the base course material came from local pits.

The several base materials were spread on the roadway, mixed with motor graders, laid out in 2-inch loose lifts, watered, and rolled. Each lift of the 5-inch compacted base was first rolled with the 9-wheel Tampa pneumatic rollers and then with a Galion 8 to 10-ton 3-wheel roller.

The subbase or roadbed treatment was built to the full width of 40 feet. The base course was just 20 feet wide. Select material was then brought in to make 4-foot-wide shoulders on both sides.

The finished base was given a two-course penetration treatment similar to that used on the roads in the Rio Grande Valley area, but cut-back asphalt or a lighter grade of asphaltement was used. On this project, the surface treatment was sublet to Roy Williamson Co., Paris, Texas.

Personnel

The Land Service Road Division of the Texas State Highway Department was set up in 1946 by Dewitt C. Greer, Texas State Highway Engineer. It was first headed by Ben Freeborough who has since retired. The present head of the division is P. S. Bailey. The work in the Rio Grande Valley was done under supervision of the Pharr District, of which J. F. Snyder is district engineer, and S. R. Busby is assistant district engineer. The work in Red River County was under supervision of the Paris district of which Les Cabaniss is district engineer. The resident engineer on the project was B. P. Burtner.

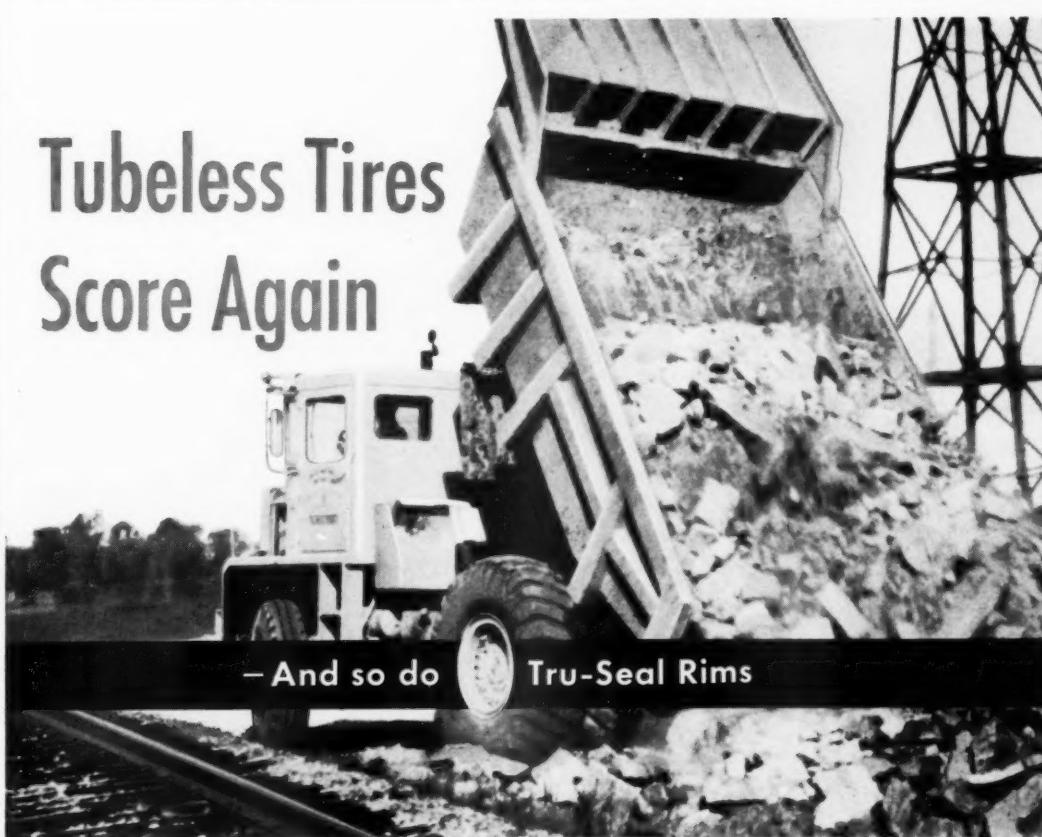
Running the jobs for the several contractors were superintendents

Ervin Cole and E. B. Darley, Jr., and foreman Charles Chambers for E. B. Darby and Co. For E. & M. Bohuskey Construction Co., the superintendent was W. R. "Bill" Humphrey. The joint-venture project of R. B. Butler, Inc., and J. H. Howard was supervised by J. E. Howard. THE END



Material for the base course on one road had to be hauled from pits in Oklahoma by a fleet of Ford F600 trucks with Omaha Standard bottom-dump trailers. Here, one of the combinations places the material on the grade.

Tubeless Tires Score Again



NOTHING's tougher on tires—or rims—than running over jagged rocks, as you may have good reason to know.

That tubeless tires can be used on such a job, and so effectively, is in large measure due to Goodyear's remarkable development—the Tru-Seal Rim. This is the rim that has been adopted as standard by the Tire and Rim Association for tubeless replacement of all conventional tire sizes 12:00 and larger.

Tru-Seal is the only practical, economical method yet devised to seal a multiple-piece rim. It's just one of the many advances resulting from Goodyear's matchless experience in building rims for every type of vehicle. When you specify Goodyear rims you get:

Unusual Strength: Thanks to an exclusive double-welding process, and added support at points of greatest stress, present-day Goodyear Rims are far stronger than previous rims.

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New Tru-Seal Rims—for sizes 12:00 and up, including all earth-mover and grader sizes. This rim is similar to multiple-piece rims now in use—PLUS airtight Tru-Seal rubber ring which compresses into sealing groove when tire is mounted.

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MORE TONS ARE CARRIED ON GOODYEAR RIMS THAN ON ANY OTHER KIND

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AGC looks forward to record year for highway and heavy construction

**Delegates, 1,700 strong, hold 38th annual
convention; ground broken for association's
own building in Washington**



Lester C. Rogers, newly elected president of AGC, is the son of the late Walter Rogers who headed the AGC in 1920. He is president of Bates & Rogers Construction Corp., Chicago.



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Wheeling Corrugated Metal Culvert Pipe withstands the torture of time and traffic — and saves highway construction dollars

It's difficult to tell exactly how long Wheeling Galvanized Corrugated Culverts will last. So often they actually outlast the road itself!

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put more emphasis on joint apprenticeship programs and support them with all that they have got, you may find in this industry very severe shortages of the highly skilled laborer that you are going to need. . . . If it isn't done, the whole industry, eight or ten years from now, may suffer drastically."

Annual report

In the annual AGC report presented by James D. Marshall, Executive Director, surveys conducted by a Special Committee on Material Supply indicate that the supply of cement will be entirely adequate in 1957, with future expansion to provide for additional requirements, and that the supply of structural steel will meet the current demand by the third quarter of 1957. Marshall also reviewed AGC activities to expedite the expanded highway construction program, to increase the number of engineers and improve engineering education, and to further the various other programs of the association.

This year the annual report appeared in a streamlined, 70-page pocket-size booklet that was arranged to give the membership "as complete an understanding as possible of: 1. the flow of authority for association actions; 2. chronological developments during the year; 3. an outline report of the principal activities carried on by the national officers and staff in cooperation with the commit-



AGC vice president Fred W. Heldenfels, Jr., a partner in the highway construction firm of Heldenfels Brothers, Corpus Christi, Texas.

tees which give guidance and advice." During the convention, six daily supplements to this report were printed and made available to the delegates at the opening of each day's sessions. Two supplements came out on Thursday, March 14—one in the morning and the other in the afternoon. These daily reports varied in size from 8 to 76 pages, and contained committee reports, texts of addresses, and final action of each meeting session. The entire convention was closely tied together by having the supplements contain the committee reports that would be under discussion at the convention session that day.

(Continued on next page)



The man in the middle is Joseph F. Nebel of Washington, D. C., who got the low-bid contract for building AGC's new national headquarters. AGC officers at the ground-breaking ceremony include, from the left: vice president Fred W. Heldenfels, Jr.; Frank J. Rooney, outgoing president; Nebel; James D. Marshall, executive director; and president Lester C. Rogers.

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(Continued from preceding page)

as well as the text of talks given the previous day. This new feature at the annual convention, prepared under the direction of the AGC national staff, was enthusiastically received by the convention goers.

Both annual report and supplements were printed in the same pocket size— $5\frac{1}{2} \times 8\frac{1}{2}$ inches—so that the members might have in convenient form a complete record of AGC's activities for the year, together

with a report on the annual convention. Heretofore, members had to wait four to six weeks before receiving an official summation of the yearly meeting.

Record year expected

At a Heavy Construction and Railroad Contractors' Division meeting, Don Buzzell, assistant manager, reported that power, navigation, flood-control and irrigation projects, water supply, sewerage works, defense installation, and railroads will reach

record levels during 1957.

According to the report, the expanding population and industrial economy of the nation, coupled with national security needs, will result in unprecedented expenditures, especially in the critical fields of water supply, pollution control, and sewage disposal. Buzzell also reported an association study made in response to concern over the construction industry's ability to carry out the planned programs. This study revealed that existing contractor organizations can

accommodate the anticipated volume, but also indicated the possibility of inadequate supplies of certain construction materials and engineering manpower.

Jim Sprouse, manager of the Highway Contractors' Division, predicted that highway construction, which reached an all-time high last year, would surge ahead at a more spectacular rate in coming years because of the impact of the Federal Aid Highway Act of 1956. From a recent AGC survey, Sprouse reported that highway construction in the next 13 years will require 49 million tons of steel, 1,339 million barrels of cement, and 128 million tons of bituminous material. When the program reaches its peak, according to the AGC manager, 450,000 men will be employed directly on highway construction jobs.

The Highway Act, as Sprouse explained, provides for \$25 billion in federal-aid funds on a 10 per cent to 90 per cent matching basis over a 13-year period to construct the nationwide interstate system, and \$2.55 billion on a 50-50 matching basis for the primary, secondary, and urban federal-aid highway systems. More federal-aid funds, he added, will be made available to the states for highway construction in the next four years of the expanded highway program than in the preceding 40 years.

The Building Contractors' Division received a report from Welton A. Snow, manager, which reviewed the generally bright outlook for building contractors. According to Col. Snow, the trend indicated for 1957 is a continuing demand for non-residential construction of all types, with the business sector planning a continued high level of capital outlays, local public bodies straining to meet accumulated and future community facility needs, and with financing problems foremost in carrying out the potential. For 1957 the potential for new construction is \$47.4 billion.

New AGC headquarters

On Wednesday, March 13, the AGC broke ground for its new national headquarters at 20th and E Streets, N.W., in Washington. Frank J. Rooney, of Frank J. Rooney, Inc., Miami, Florida, the AGC 1956 outgoing president, turned up the first shovelful of dirt. The three-story and basement building will be occupied exclusively by the AGC. The exterior will be buff Indiana limestone, glass, and aluminum on three sides and brick in the rear. It will have an 85-foot front and extend 75 feet deep on a 100×100-foot lot, and will contain about 19,000 square feet of office space. This area contrasts favorably with the 9,000 square feet in the present AGC rented headquarters in the Munsey Building, Washington.

The job was awarded to the Joseph F. Nebel Co., Washington, D.C., on a low bid of \$534,310, and work is expected to get under way this month. The low-bid contractor was one of six members of the AGC Master Builders Association District of Columbia to which the bidding was limited by the architect—Chatelain,

How to widen streets fast



This No. 977 Traxcavator* digs concrete, asphalt and compacted earth, loads a truck every 2 minutes, grades as it goes

Vogel Construction Corp. was widening 1.6 miles of 38th Street, Indianapolis, Ind., when this picture was taken. The job included excavating 40,000 cu. yd. of old concrete, digging up front yards and driveways. Street width was increased from 40 to 80 feet. And most of the work was done by a CAT* No. 977 Traxcavator.

Hard earth, broken concrete and asphalt are tough materials to dig, but the machine's superior pry-out action resulted in full bucket loads. The main problem was keeping enough trucks under the bucket. The No. 977 was loading a truck in less than 2 minutes, and it maintained a good level grade as it dug. Vogel Construction Corp. also found the No. 977 good at skimming asphalt off of old pavement.

Caterpillar-built Traxcavators have been designed for one purpose—to increase your production and cut costs. The No. 977, largest of the line, gives you the power and performance for big road jobs. Its 100 HP engine and ample track surface back up the $2\frac{1}{4}$ cu. yd. bucket with

tremendous digging force. Quick-acting hydraulic controls add to the machine's great maneuverability. It's easy to operate and has maximum job visibility.

Balanced weight distribution makes for good stability on rough terrain or steep grades. The 40-degree tilt-back of the bucket at ground level prevents spillage. And the bucket can be raised almost 12 feet for high load clearance.

Get the full story of this rugged, modern excavating tool from your Caterpillar Dealer. He'll demonstrate the No. 977's performance on your own job, and he stands behind its long, profitable work life with dependable service and parts you can trust.

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Gauger & Nolan, of Washington.

A target of \$800,000 has been set up for an AGC building fund to cover such things as the cost of the land, architect's fee, building, and contingencies.

Government spokesmen

Several government spokesmen advised the contractor groups as to what they might expect in the way of construction programs in the year ahead. Maj. Gen. Lee B. Washbourne, assistant chief of staff, installation, Department of the Air Force, stated that the Air Force has requested construction funds of \$1.275 billion for the fiscal year 1958, as compared with \$1.228 billion last year. He told the AGC that the Air Force construction program, according to the Secretary's predictions to Congress, will remain unchanged for the next several years at about \$1 billion or \$1.250 billion a year, plus an equal amount in maintenance and operations funds and private capital devoted to family housing.

Commissioner of Reclamation W. A. Dexheimer declared that for the following fiscal year, beginning July 1, a construction program of \$183,000,000 for the Bureau of Reclamation has been proposed to Congress. Work will continue on 67 projects. For the next fiscal year, construction activities involve work on 26 storage dams, 11 diversion dams, 12 power plants and four pumping plants. Construction contracts involve work on 330 miles of main canals and 390 miles of transmission lines.

Federal Highway Administrator Bertram D. Tallamy revealed that in the eight months since the expanded highway construction program was started, \$1.4 billion worth of work has been obligated. "On the interstate system alone we have contracted for \$441 million worth of construction involving 791 linear miles of highway," Tallamy said. "By March 1, 1957, eight different states had committed all of the funds which we apportioned to them for the fiscal year 1957. And they have already begun to use their funds for 1958."

The highway head said that he was surprised to find that about half of the entire fund on the interstate system is going to be spent in our cities and suburban sections, but that this is very proper since a nationwide trunk system must have adequate connections into and out of the major points of origin and destination of traffic.

Airfield paving tolerances

In the Heavy Construction Division, a Contract Forms and Specifications Task Unit reported on a discussion with the U. S. Corps of Engineers regarding recently adopted tolerance requirements for airfield paving. Contractors had been having great difficulty in meeting existing tolerances. Maj. Gen. E. C. Itschner, Chief of Engineers, Department of the Army, stated that the Air Force wants a smooth runway but never did specify exact tolerances.

The relaxed or modified tolerances

permit no more than $\frac{1}{8}$ -inch deviation in 12 feet longitudinally, and $\frac{3}{16}$ -inch in 12 feet transversely where the cross slopes are 1 per cent or less. Where the cross slopes are greater than 1 per cent, a $\frac{1}{4}$ -inch deviation in 12 feet is permitted. This compares with a $\frac{1}{8}$ -inch tolerance in 16 feet, both ways, before this revision.

To assist the contractor, the Corps of Engineers will also establish bench marks 200 feet off the runway at 1,000-foot intervals.

Gen. Itschner pointed out that the Air Force does not want its fliers complaining that their planes "porpoise" on a runway. Thus if these new criteria for tolerances are not satisfactory, they will be subject to change. The Engineers head sug-

gested that planes be designed to prevent "porpoising."

Bidding errors

Bidding errors was touched on by Commissioner Dexheimer, Bureau of Reclamation, who stated that "irregularities and misunderstandings in bidding not only result in delaying award of contract, but cast reflections on the integrity of the bidders." Gen. Itschner also mentioned cases "where the contractor has qualified his bid in such a way as to put both of us in a great deal of difficulty.... We feel that it is unjust to other contractors to make an award if anybody qualifies his bid."

According to a classified report of the Corps of Engineers, 159 errors were claimed on Corps of Engineers

bids over a 40-month period. In a general discussion, contractors from the floor criticized the "repeaters and professionals" who are making errors to gain an advantage in bidding. One member scored the practice of making errors since it permitted the firm making the error to get "a peek at the cards of all bidders and then make an advantageous second bid."

From this discussion stemmed a resolution recommending the following principles to agencies which award construction contracts:

1. The only relief granted to a bidder who claims error in his bid is permission to withdraw his bid.
2. A bidder claiming error in his bid shall be disqualified from bidding on the particular project again.

(Continued on next page)



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3. In the event that an error is claimed by a bidder and acknowledged by the awarding authority, the erroneous bid shall be considered void, and action shall be taken on the remaining bids as if the erroneous bid had not been submitted.

Gen. Itschner expressed sympathy with the intent of the resolution, but pointed out that the General Accounting Office has taken bidding out of the hands of the Corps of Engineers, and questioned the legality of any move that would prevent a contractor from re-bidding a job.

Other resolutions

Other significant resolutions approved by the AGC dealt with subcontractor relationships, and damage to construction machinery on projects

financed with public funds.

One labor resolution approved by the contractors reaffirmed the association's faith in the Taft-Hartley Act as "constructive legislation," recommended support of amendments to clarify and strengthen the law, "particularly with respect to provisions banning secondary boycotts," and opposed "any and all weakening amendments." AGC recommended provisions that would "provide for mandatory injunctions in jurisdictional disputes."

Other labor resolutions included:

1. opposition to any further extension of the wage and hour law to construction operations;
2. support of legislation to limit coverage of the Fair Labor Standards Act to hourly paid laborers and me-

chanics employed on the site of construction;

3. support of legislation which would clarify the term "regular rate of pay" used in determining overtime payments;

4. support of the National Joint Board for the Settlement of Jurisdictional Disputes.

The AGC also endorsed the principle "that the predetermination of prevailing wage rates paid on public construction projects is a proper function of the states rather than of the federal government." The organization also opposed the extension of federal predetermination of prevailing wage rates to projects not already covered and any "legislation which would include fringe benefits and working conditions in the predetermi-

nation."

Other officers elected

New AGC president Lester C. Rogers has the distinction of being the first son of a past president of the AGC to hold the same office. His father, the late Walter A. Rogers, who was also president of Bates & Rogers Construction Corp., served as president of the AGC in 1920. Rogers succeeds Frank J. Rooney, a Miami building contractor, as president.

Among Division officers elected at the convention is Charles B. Solomon of the Geo. B. H. Macomber Co., Boston, chairman of the Building Contractors' Division. Ira H. Hardin of the Ira H. Hardin Co., Atlanta, Ga., is vice chairman.

The Highway Contractors' Division has W. Ray Rogers of Rogers Construction Co., Portland, Oreg., as chairman and Manley Osgood of Ann Arbor Construction Co., Ann Arbor, Mich., as vice chairman.

The chairman of the Heavy Construction and Railroad Contractors' Division is Robert M. Hoover, Kansas City Bridge Co., Kansas City, Mo. Charles L. Harney, Chas. L. Harney, Inc., San Francisco, is vice chairman.

The 1958 convention will be held in Dallas, Texas, February 10 through 13 at the new Statler Hotel.

THE END

HRB bulletin discusses highway rights-of-way

The Highway Research Board's committee on land acquisition and control of highway access and adjacent areas has summarized the 1955 developments in its field in Bulletin 140, "Right of Way".

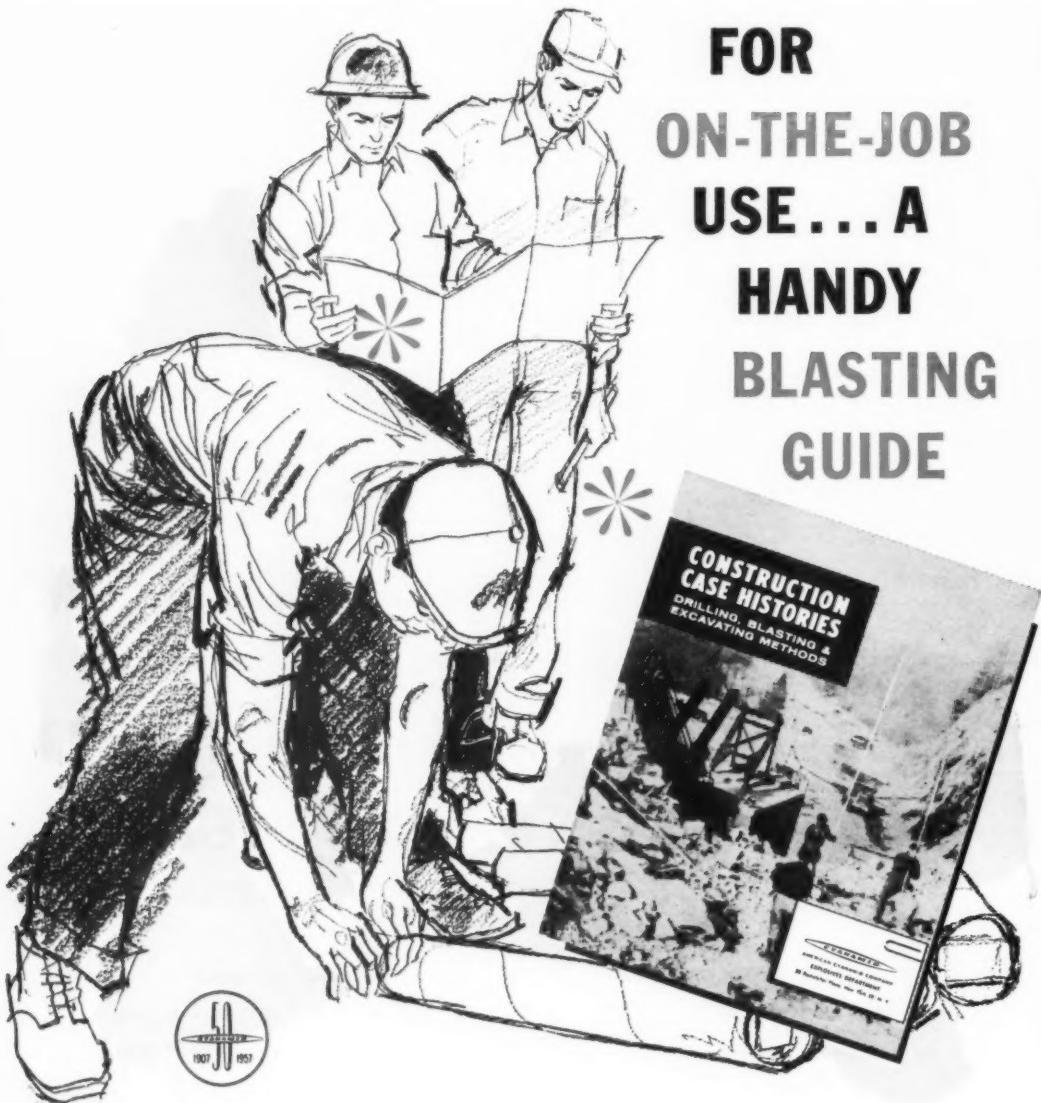
Some phases of the expressway problem are the subject of three papers. Limiting access to the existing highways covers the legal aspects of converting a conventional-type highway to one of expressway design. The second paper relates how Oklahoma successfully used police power to control access to expressway projects. The importance of relating highway planning to over-all urban planning is detailed in the third paper.

The last two papers report on new ideas in roadside protection being developed in Wisconsin, and the techniques and methods used by New Jersey to rid the roadside of fixed and moveable objects, and unauthorized works within highway rights-of-way.

Air Force plans training base for missile units

The major portion of the Camp Cooke Military Reservation at Lompoc, Calif., has been transferred from the U. S. Army to U. S. Air Force jurisdiction for use as a training base for Air Force missile units.

Extensive rehabilitation, modernization, and construction will be required over an extended period. This will include improvements for the cantonment area, and the erection of technical facilities and family housing units.



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Michigan Highway Conference attended by over a thousand

Speaking on intergovernmental approaches to solving local highway problems at the opening session is Paul M. Reid, executive director of the Detroit Metropolitan Regional Planning Commission. Others at the speakers' table, left to right, are David R. Calhoun, C. A. Weber, and John C. Kohl.



Well over a thousand visitors from throughout the state converged in Grand Rapids, Mich. to attend the 42nd Annual Michigan Highway Conference held at the Pantlind Hotel, March 12 through 14.

The conference, which is sponsored by the County Road Association, Michigan Municipal League, Michigan State Highway Department, and the College of Engineering of the University of Michigan, was attended by members of these organizations as well as representatives of more than a hundred construction dealers and allied suppliers to the highway industry.

Varied aspects of the state's expanding roadbuilding program were discussed by prominent men in their field. In the first general session, Paul M. Reid, executive director of the Detroit Metropolitan Planning Commission, explained how local highway problems could be solved through the cooperation of federal, state, county and city agencies. To illustrate his point, Reid pointed to the inter-agency study of origin and destination data compiled by a survey of vehicles entering and leaving the Detroit area. This study, made jointly by the Bureau of Public Roads, Wayne County, Michigan State Highway Department, and the city of Detroit in 1953, has proved of great value in the design and layout of future expressways.

John C. Kohl, professor of civil engineering at the University of Michigan, pointed out in his speech that the new federal-aid program has actually made the financing of local roads and streets more difficult. In the following talk, C. A. Weber gave a clear picture of state trunkline funds and their availability for local areas.

Among the pertinent subjects treated in the following sessions were: the impact of interstate and trunk-line highway improvements on local communities; and technical manpower for the highway program. In the technical session, a panel of experts discussed the means of improving the quality of aggregates by the beneficiation method. This is the process by which the softer, undesirable particles are separated from the aggregate.

THE END

Toll collections on the New York State Thruway came to a total of \$1,293,512.55 for February, an increase of 21.4 per cent over February, 1956. Income for the first two months of 1957 is 21.6 per cent higher than for the first two months of last year.

APRIL, 1957



Strength, Color and Workability of Atlas Mortar are features that pleased Contractor L. A. Swyer of Albany, N. Y., on Dormitory Building job (above) at Rensselaer Polytechnical Inst., Troy, N. Y. Clean, modern design is work of Architect Henry L. Blatner, Albany.

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Total of materials used on Fla. turnpike section

The magnitude of the task of building the Miami to Fort Pierce, Fla., section of the Sunshine State Parkway can be gained from the totals of materials used and the areas over which the work was spread.

The first part of the project was clearing and grubbing a 174,240,000-square foot area.

Muck had to be dug out from numerous places and excavations for the 28 bridges on the turnpike. This required digging out 448,000 cubic yards of dirt before the 14,500,000 cubic

yards of dirt fill could be placed on the roadways. In addition to this, 5,195,740 square yards of stabilization material was mixed with the fill dirt.

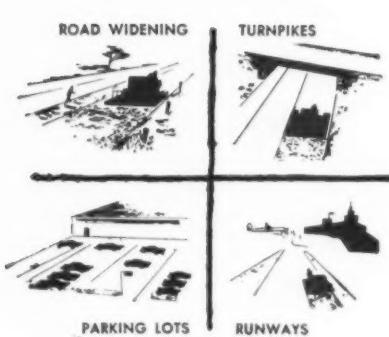
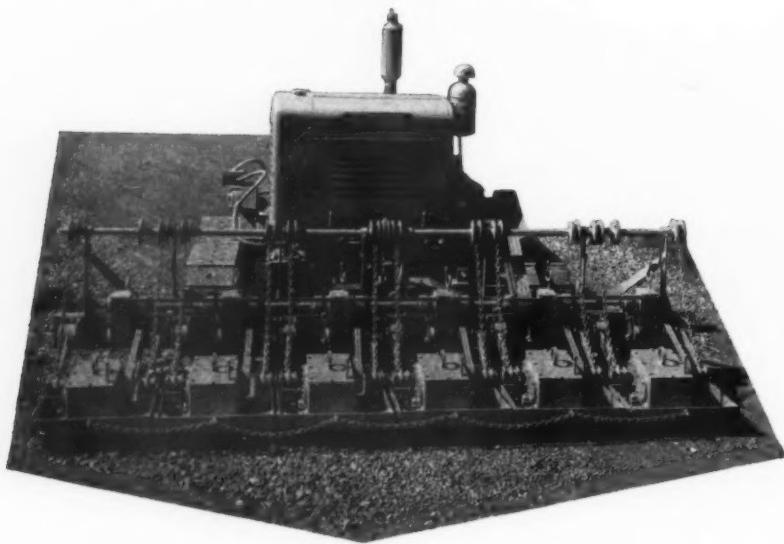
The 8-inch deep limerock base required 3,488,000 square yards before 454,000 tons of asphaltic concrete was placed on the base.

Construction of bridges, culverts, and headwalls required 11,800 tons of concrete. The beams which hold up the decks of bridges amounted to 7,117 tons. Reinforcing steel amounted to 2,892 tons.



One of the new GMC 1957 air suspension tractors gets a last-minute going over as it rolls off the final assembly line.

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* International Vibration Company guarantees single-course compaction to required density and the mechanical performance of each Vibro-Tamper. See your equipment dealer for express warranty.

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Air suspension replaces springs on GMC trucks

■ The 1957 line of heavy-duty trucks and tractors manufactured by the Truck and Coach Division of the General Motors Corp. includes several models utilizing an air suspension system in place of conventional springs. Other new features include lightweight aluminum cabs and turbocharged diesel power plants.

The GMC air suspension system, incorporated into 10 basic models of the 1957 line, consists of rubberized cushions of air that absorb heavy road jolts and high-frequency vibrations before they reach the frame. Conventional leaf springs are replaced by air-filled rubberized bellows.

All GMC air suspension tractors can be used with any kind of trailer or semitrailer, regardless of whether they have conventional steel springs or torsional suspensions, the company reports. The use of air suspension on the tractors permits the lowering of the fifth wheel, which allows an increase of from three to eight per cent in trailer cubage. This means additional space for greater payloads.

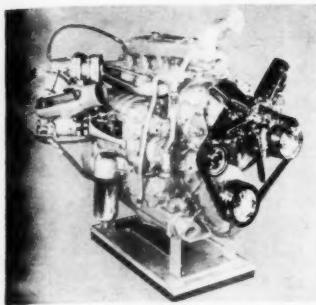
Air suspension also eliminates spring repairs and lubrication, provides a smoother ride, maintains a constant vehicle floor height for simplified loading and unloading, reduces body maintenance by absorbing road jolts, and permits the use of weight-saving components for an overall reduction of vehicle weight, according to GMC.

Overall vehicle weight is further reduced by the new lightweight aluminum cabs. The cabs are featured on all Series 800 and 860 air suspension tractors.

In the line of heavy-duty engines to power the GMC trucks and tractors are three diesels: the turbocharged four-cylinder 4-71T; the turbocharged six-cylinder 6-71T; and the 6-71SE Super Economy diesel. Both the 171-hp 4-71T and the 236-hp 6-71T utilize exhaust gases from the engine to cut fuel and maintenance costs, improve engine life, and increase power and efficiency.

A hydraulically-driven fan is stand-

CONTRACTORS AND ENGINEERS



The new 4-71T four-cylinder diesel engine is shown with its turbo-charger at the left and its hydraulically driven fan at the right.

ard on all GMC diesels for 1957. It is thermostatically controlled so that it runs only when engine cooling is required, and does not waste horsepower by operating when cooling is not needed. According to GMC, the new fan increases fuel economy three to five per cent.

The 6-71SE with its 190-hp rating is engineered for a combination of economy and durability. With cylinder wall ports 18 per cent larger than conventional two-cycle diesel ports, a four-valve head, and redesigned pistons and injectors, the 6-71SE provides freer diesel engine breathing and more efficient exhaust scavenging, permitting the engine to do more work with less strain.

For further information write to the General Motors Corp., Truck and Coach Division, 660 S. Blvd. East, Pontiac 11, Mich., or use the Request Card at page 18. Circle No. 133.

Manual for truck drivers stresses equipment care

A 1957 Truck Drivers Guide, issued by the North Carolina State Highway Commission, deals with general truck maintenance, lubrication, cleaning and care of tools and tires, and traffic regulations.

The manual was prepared by state maintenance engineer B. W. Davis with the aid of material from the North Carolina State College, Division of Extension—Truck Driver Training School; and the American Trucking Association, Inc.

Copies of the manual may be obtained from the North Carolina State Highway and Public Works Commission, Raleigh, N. C.

New air brake series offered for trailers

A new 16½ × 8½-inch "P" series air brake for its TK-500 trailer axles has been announced by the Timken-Detroit Axle Division of the Rockwell Spring & Axle Co. The new series brakes are for heavy braking applications and are mounted on TK-500 series axles with a load rating of 18,000 pounds on the tires for each axle. Ten-stud lightweight hubs and drums are available for the 16½ × 8½-inch brakes.

For further information write to the Timken-Detroit Axle Division, Rockwell Spring & Axle Co., Ashtabula, Ohio, or use the Request Card at page 18. Circle No. 142.

Power trowel line has modified blade system

A modified trowel blade system that permits the Kelley Hydra-Trowel to do an excellent job of floating without sacrificing the quality of its finishing characteristics has been announced by the Kelley Machine Division of the Wiesner-Rapp Co. The new system permits floating operations just as soon as is desired without using float plates.

The modified trowel blade system is available on the 34 and 44-inch Kelley Hydra-Trowels. The finger-tip blade pitch control positions the blades for either floating or finishing.

When floating, the company reports, the blades slice off high spots and fill up hollows, providing a level

A modified trowel blade system on the 34 and 44-inch Kelley Hydra-Trowels permits floating operations as soon as is desired without the need for float plates.



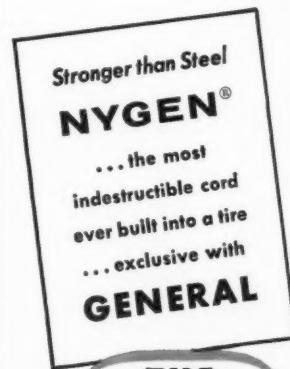
and tight concrete floor surface. They bring up just enough cement for finish troweling operations, according to the company. Anything from a coarse sand finish to a polished burnished finish is obtainable.

For further information write to the Kelley Machine Division, Wiesner-Rapp Co., 285 Hinman Ave., Buffalo 23, N. Y., or use the Request Card that is bound in at page 18. Circle No. 138.

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move 465,000 cu. yds. of dirt to meet 120-day deadline date for Berghuis Construction Co.



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Work Bulls pay off

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Work Bulls provide the right tractor power with design-integrated attachments to build profit on these and scores of other jobs!



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Work Bulls put former hand work on a paying power basis. With five tractors (34 to 52 hp)—choice of 20 switch-in-a-smoke-break attachments—Work Bulls pay off on small, scattered work-and-run jobs...earn their keep off-season, too, removing snow or handling other similar jobs.

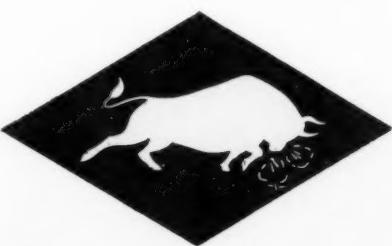
...as backup machines

With Work Bulls you get the exact power/equipment cost ratio the job demands...increase equipment scheduling efficiency...cut down overhead. Work Bulls move from site to site through city traffic or cross-country...without permit troubles, without flatbed and other costs.

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When you're using shovels to clean up spill in the loading area, scrapers to smooth out haulroads, crawler dozers to pull wagons or skid light and medium-weight machinery—there's a profitable place for Work Bulls on your job. In fact Work Bulls help make your "big stuff" more profitable.

Work Bulls have a profitable place on every project. Check to see which of the 5 tractors (34 to 52 hp) and 20 easily interchangeable attachments you need. Write for free 24-pg. catalog and the name of your Work Bull distributor.



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Racine, Wisconsin

21

42 hp DAVIS PIT BULL

(far left) is equipped with hydraulically controlled $\frac{1}{8}$ -yd. loader. Broom, blades, swinging crane or fork lift can be mounted on same loader frame and arms. The Pit Bull features a torque converter and combination feed and reversing clutches as standard equipment.

34 hp WORK BULL MODEL 202

(center) with rear-mounted post hole digger that digs perpendicular holes even when working on slopes. PTO driven, the attachment can be used with either 8 or 12" augers. Other rear-mounted attachments include the Model 185 backhoe, reel and rotary mowers, multi-purpose blade and a pipe and cable layer. Front-mounted attachments include loader, blades, broom and fork lift.

52 hp WORK BULL MODEL 404

(left foreground) is biggest, most powerful tractor in line. Available with gasoline or diesel engines it has five forward speeds and optional power steering. Model illustrated is equipped with low, direct-thrust $\frac{1}{4}$ -yd. loader and a fingertip-operated hydraulic backhoe which handles 12 to 36-in. buckets, digs to depth of 12½ feet.

The special role of the state highway department in the carrying out of the federal-aid highway program came under close scrutiny recently as the Association of Highway Officials of the North Atlantic States held their 33rd annual convention.

In particular, problems created both by the increased volume and complexity of state work and by the acute shortage of engineering personnel occupied the attention of the nearly 1,000 delegates from eleven states and the District of Columbia who attended the three-day meeting February 27 through March 1 in Atlantic City.

Leaders in all segments of the road-building industry addressed the assembly on such subjects as administration of the new program, use of electronic computers in highway work, consulting engineers in public work, and the impact of the roads program on the public.

Elected president of AHONAS for the ensuing year was Earl J. Mattis, superintendent of the department of highways for St. Lawrence County, New York, and former vice president of the association. He succeeds John O. Morton, commissioner of the New Hampshire State Highway Department.

David H. Stevens, chairman of the Maine State Highway Commission, was elected vice president, and Kenneth D. Rice, secretary of the New Jersey State Highway Department, was re-elected secretary-treasurer.

Role of consultant

Perhaps the most important session of the convention was devoted to a panel discussion of the topic, "Consultants in Public Works—Their Function and Relationship." Speakers included two members of consulting engineering firms and two state highway engineers.

The first speaker was Mason G. Lockwood, a partner in the firm of Lockwood, Andrews & Newnam, Houston, Texas, and 1957 president of the American Society of Civil Engineers. He reported on the situation by summarizing the results of interviews with representative highway engineers.

The ASCE official told his audience that state highway departments will achieve "the greatest net return . . . by using consultants on the larger, more specialized projects, where initial supervision and explanation time is a relatively minor portion of the total man-hours required for the project engineering."

Differences of opinion which will arise when consulting engineers work alongside state highway engineers must be resolved with broadmindedness and cooperation on both sides, Lockwood declared. He urged that the services of the joint AASHO-ASCE committee be used as much as possible to iron out these differences "and to create and maintain a mutually workable relationship" between, highway

Highway officials assess roads program

AHONAS examines states' assignment in light of engineer shortage, other problems

3 Payhauler Units match 4 competitive rigs on "W.Va.'s most dangerous road job!"

**Earn 25% equipment saving
...33% production gain for
Acme Construction Company,
Bluefield, West Virginia**

In the mountain-rugged, rough and rocky country of southern West Virginia, three International "65" Payhauler trucks are doing the work of four similar competitive units...on the same job...under the same tough conditions. The location is Welch, where Acme Construction Company of Bluefield, is moving 100,000 cubic yards of rocky material "clover-leaving" U. S. Bypass Route 52...labeled by Jim Chase, superintendent, as "West Virginia's most dangerous road job."

All haul units on the job are in the same capacity and power class. They're all loaded by a 1½ cu yd shovel...they all travel the same ½-mile to the fill and the same return route. Yet, the Payhauler trucks because of their ample, turbo-charged diesel power, plus load-matched gear ratios, smooth the get-away—and permit quick shifting into time-gaining, hill-climbing higher gear! This performance under rough and rugged conditions has caused Jim Chase to say, "We get the same production from 3 International '65' Payhaulers as we do with our four other units...a 25% savings in equipment, a 33% gain in production."

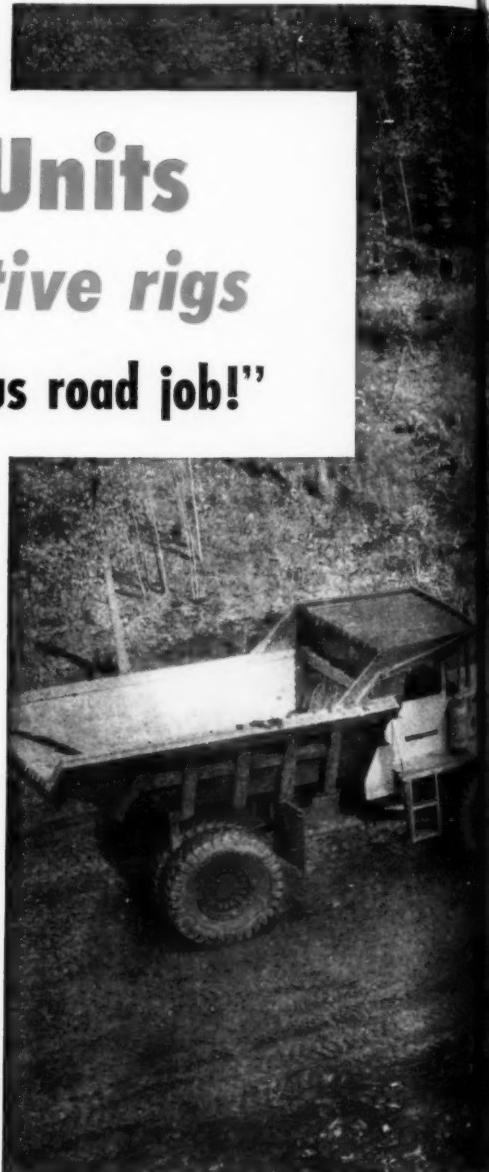
Prove to yourself how much an International "65" or "95" Payhauler will boost your off-highway hauling capacity. Try its safe and easy full-load maneuverability. Test the power-transfer efficiency of its long-lasting Cerametallic-faced clutch. Ask your International Construction Equipment distributor for a demonstration!



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... Off-Highway Trucks ... Diesel and Carbureted Engines ... Motor Trucks



International TD-24 does shot-rock down the slope to 1½ cu yd shovel and easy-loading International "65" Payhauler. 250,000 pounds of dynamite were used...about a pound to every 3 yds of rock!



department engineers and consultants.

Nomer Gray, associate of the firm of Ammann & Whitney, New York City, enumerated several practices which he said state highway departments have used in their dealings with consulting firms and which are resented by the consultants. Among these were a department's dealing with several consulting firms and seeking the firm with the lowest fee,

failing to put in writing conditions for extra work and other elements when there is a strong likelihood that the department administration or personnel with whom the firm is dealing will change, holding up a percentage of the firm's fee until the last phase of a project is completed—sometimes a matter of many months or several years, and failure to back consulting firm personnel in supervisory posts on a state highway job.

The consultant asked for greater understanding of the consulting engineer's situation on the part of the highway department personnel who hire him and work with him.

A state highway engineer from New Jersey, O. H. Fritzsche, pointed out that the situation as regards consultants in highway work is today the reverse of what it formerly was. Whereas consultants were formerly only called in on specialized jobs that

highway department engineering personnel could not handle, the consultants are now being called in to do routine highway engineering jobs because of the shortage of highway engineers.

Mr. Fritzsche said this situation means that consulting engineers are often working in areas completely foreign to them, and that consequently there is a need for closer supervision of their work by state highway personnel.

One state's experience

The last speaker on the panel, Norman S. Pritchett, chief engineer of the Maryland State Roads Commission, told of Maryland's experience with consulting engineer firms during the last 10 years. He said that during that period the state highway department hired 48 consulting firms, and that these firms handled a total of 15 per cent of the surveys, 32 per cent of the inspection done during that time.

For the most part, the Maryland engineer's talk was a listing of dissatisfactions his state had experienced with these consulting firms. He cited errors of calculation, specification, classification of materials (based on ignorance of the areas of work), design, and cost figuring. He mentioned item after item pointing to carelessness both in design and in other types of work. He said that many consulting firms have shown an ignorance of present-day construction procedures.

Despite this listing of dissatisfactions, Mr. Pritchett said his state roads commission has had "generally satisfactory dealings with consulting firms." Maryland has 12 such firms under contract at the present time, he reported, and plans to continue using consultants as the need arises.

Prior to this panel, H. A. Radzikowski, chief of the maintenance branch of the Bureau of Public Roads, discussed the use of electronic equipment in state highway work. He mentioned the use by particular states of various electronic devices such as computers, illustrating the savings in time and labor effected in each instance. The speaker also showed how other uses of this equipment could be expected to speed much of the preparatory work in highway roadbuilding. (Mr. Radzikowski's talk appears on page 120 of this issue.)

Prominent personalities in the national roadbuilding picture addressed the highway officials at the opening session. Bertram D. Tallamy, federal highway administrator, reviewed both the progress of and the plans outlined for the federal highway program. Julien R. Steelman, president of the Koehring Co. and recently elected president of the American Road Builders' Association, told the engineers what the ARBA is doing to help with the federal road program, alleviate the engineer shortage, and

(Continued on next page)



Ample power from a 250 hp Turbo-charged engine drives the model "55" at production-booster speeds...with fuel consumption savings of 10% or more. Ten-speed transmission gives right gear for every grade...every road condition.

Double acting hoist cylinder in all stages with 106,300 pounds of force in first stage permits dumping heaped loads in less than 10 seconds. Hydraulic snubbing action prevents undue stress on hoist cylinders and "gentles" body return to frame.

Strongest frame in its class and big 10 x 14 foot high tensile steel Payhauler body permit faster, more carefree loading of rock or other tough materials. Model "65" Payhauler body gives you big, profit-booster, 18-ton capacity, model "95" a husky 24 tons.



(Continued from preceding page)
in other ways serve the industry.

As concrete suggestions for highway department action to increase contractor efficiency on roadbuilding projects, the ARBA official offered these:

1. reduce the time required to pay contractors their partial payment vouchers;
2. limit the retained percentages of 10 per cent to payments for the first 50 per cent of the project;
3. encourage the use of photogrammetry and aerial photography to compute final pay quantities;
4. pay interest to the contractor where delays in final payments exceed 60 days;
5. modernize equipment performance specifications so as to allow the contractor greater latitude in applying the machinery he knows to be best for the job.

Public relations

A. E. Johnson, executive secretary of the American Association of State Highway Officials, also spoke at the opening session. He told the state highway officials that good public relations programs were a "must" from now on if the federal road program is to be a success, and offered suggestions as to how such programs might be carried out.

Administration of the new federal program was the topic of another panel offered during the convention. Speakers were William J. Miller, deputy chief engineer of the Delaware State Highway Department, who examined the subject from the standpoint of planning and traffic; Joseph Barnett, assistant deputy commissioner of the Bureau of Public Roads, who spoke from the viewpoint of the Bureau; Henry J. Kaltenbach, Washington, D. C., right-of-way consultant, who discussed the acquisition of right-of-ways; and Frederick M. Auer, planning and economics engineer for the New Hampshire Department of Public Works and Highways, who spoke from the standpoint of administration at the state level.

Another top ARBA official, Maj. Gen. Louis W. Prentiss, USA (Ret.), executive vice president, participated in a panel on the impact of the roads program on the public. He discussed the program from the standpoint of defense.

A final panel continued the examination of various aspects of the new highway program. Speakers and their topics were George N. Lewis, Sr., traffic engineer of the Maryland State Roads Commission, traffic engineering; G. I. Sawyer, chief of the office of planning, design, and engineering of the District of Columbia Department of Highways, plans and engineering; George W. McAlpin, director of the bureau of soil mechanics of the New York State Department of Public Works, research; and Arthur Olcott, supervisor of right-of-ways purchases for the Connecticut State Highway Department.

Announcement was made that the 1958 convention of AHONAS will be held at the Emerson Hotel in Baltimore.

THE END

The prime mover of the Oliver 990 6.7-cubic-yard scraper can be converted for use as a four-wheel tractor for standard drawbar work.

Versatile scraper has 6.7-cubic-yard capacity

■ A self-propelled scraper with a capacity of 6.7 cubic yards is announced by The Oliver Corp. The unit is especially recommended for clean-up and fill-in jobs, and for operations in congested, confined areas.

The Oliver 990 is powered by a three-cylinder GM diesel delivering 77.4 drawbar horsepower through a



six-speed transmission. A torque converter is available as optional equipment. All controls on the scraper are operated hydraulically.

The rig has a three-section 7-foot cutting edge, and a high bowl clearance and a high apron lift. An ejector operated by a hydraulic jack effec-

Look at This
Brand New
Construction Tool!

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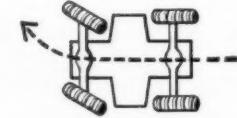
7-TON CRANE . . . 3/8-YD. SHOVEL - DRAGLINE CLAMSHELL - HOE

will do things
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can do!



NO OTHER MACHINE CAN
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SINGLE AXLE STEERING
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23 ft. Turning Radius

TWO-AXLE STEERING
(Available)



15 ft. Turning Radius

"Crabbing" Sideways

SP-107

fast . . . mobile . . . maneuverable

tively dumps all loads, dry or sticky. With a special kit, the prime mover of the Oliver 990 scraper can be converted into a four-wheel tractor for standard drawbar work and for use with other attachments.

For further information write to The Oliver Corp., 400 W. Madison St., Chicago 6, Ill., or use the Request Card that is bound in at page 18. Circle No. 61.

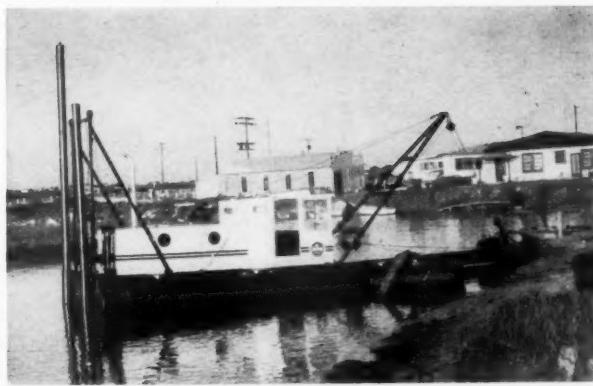
Better arc welding

A wall chart explaining how to get better arc welding results is available from the Hobart Bros. Co. The chart

lists and gives instructions on the use of carbon and low-alloy steel, iron powder, hardfacing and buildup, cast iron, and stainless steel electrodes.

The chart also reminds the welder of the four essentials of proper welding procedure and shows types of joints, typical welding positions, standard steel shapes, and causes of common welding troubles and what to do about them.

To obtain Chart EW-198 write to the Hobart Bros. Co., Hobart Square, Troy, Ohio, or use the Request Card that is bound in at page 18. Circle No. 94.



The Dixie-Dredge can be transported from job to job on low-bed trailers and set up by two men in two hours without cranes for special handling.

Dredge transported on low-bed trailers

A portable dredge that can be transported from job to job on two low-bed trailers without exceeding highway weight, height, width, or length limitations is available from the Service Machinery Corp. The Dixie-Dredge can be dismantled and set up without the use of cranes for special handling.

The Dixie-Dredge employs a completely hydraulic cutter power unit mounted on the head end of the ladder for more efficient digging. The short shaft between the power unit and the cutter allows more power to reach the cutter and cuts shaft maintenance, the company reports. The cutter is made of cast steel with replaceable teeth.

Two men can completely assemble the dredge in two hours, the company reports. The rig is then pushed into the water by a bulldozer. The Dixie-Dredge is available in two sizes. Model CD-8 has a digging depth of 22 feet and requires a 2.2-foot working draft. Model CD-10 digs to 26 feet and requires a 2-foot draft.

For further information write to the Service Machinery Corp., North Miami, Fla., or use the Request Card at page 18. Circle No. 65.

SP-107

SQUARE DESIGN — NO OUTRIGGERS

The "SP-107" Carrier is 8 ft. wide with 8 ft. wheelbase. With this close-coupled "square" design, you get full rated lifting or digging capacity in every turntable position throughout the 360° swing. With no time-consuming outriggers to set or unset, you get maximum capacity with instant mobility.

TORQUE CONVERTER . . . Gives you automatic adjustment of engine torque to match machine, travel and load conditions. Also provides "throttle control" for precise control of load lowering.

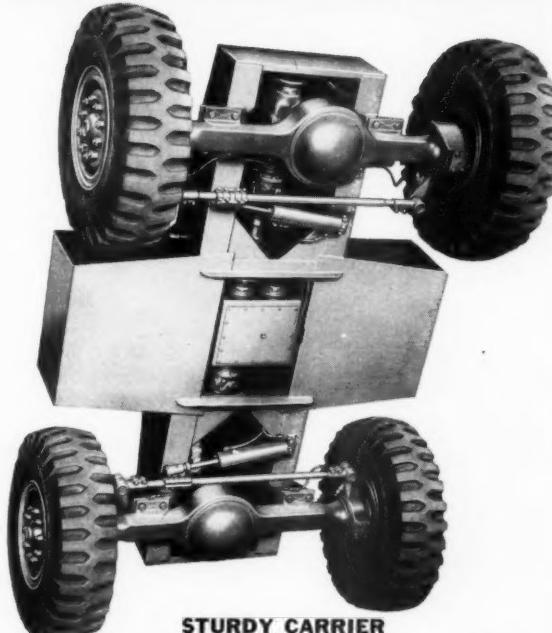
OFF-THE-HIGHWAY SERVICE . . . Powerful 4-wheel drive provides maximum tractive effort for rough terrain . . . big tubeless tires give plenty of flotation for soft ground travel . . . which means the "SP-107" will go most places a crawler will go.

15 M.P.H. MOBILITY . . . You get 3 or 6 travel speeds up to 15 m.p.h. through a smooth, automatic transmission. The "SP-107" is an agile, fast-stepping Self-Propelled Crane that does not need a trailer to move from job to job.

INDEPENDENT TRAVEL . . . This standard feature makes it possible to (1) travel, (2) hoist, (3) swing, and (4) derrick the boom—separately, in any combination, or all at the same time, with each operation controlled by an independent hydraulic clutch. Gives you greater maneuverability and flexibility of operation.

4-WHEEL STEERING . . . For the utmost in maneuverability and shortest turning radii, two-axle steering is available (see diagram). Front and rear axles steer independently of one another, permit maneuvering and working in closer quarters, permit "crabbing" sideways to "snug-up" to loads.

Get the "SP-107" story from your Thew-Lorain Distributor.



STURDY CARRIER

The Carrier is designed expressly for the "SP-107." Note the sturdy, non-weave "cross-frame" and the 2-axle hydraulic power steering (extra).



Caterpillar booklet deals with highway program

To answer the questions that are being and will be asked about the new federal-aid highway program, Caterpillar Tractor Co., Peoria, Ill., has released a new booklet, "The Road Ahead". The booklet is designed to give the public a working knowledge of the future of American highways under the program.

Showing step-by-step how the nation intends to build a 41,000-mile system of superhighways, the booklet explains the how, what, and why of the program. Figures illustrate how money each state will receive and for what the money will be used. Illustrations show how the new roads will look when they are finished. The citizen's role in creating this new network of highways and the necessary methods are discussed.

Copies of "The Road Ahead", Form D705, may be obtained from the Advertising Division, Caterpillar Tractor Co., Peoria, Ill.

For more facts, circle No. 217

THEW

LORAIN



The Hoosic River model, 200 feet long and two to three feet wide, has seven super-elevated curves along its course. The water supply enters the stilling basin in the foreground.

Waterway models used by Corps for erosion tests

Important tools in studying flood and soil erosion problems are the simulated hydraulic-scale models of waterways, used for test purposes by the U. S. Army Corps of Engineers. Two such models under test at the Corps' Waterways Experiment Station in Vicksburg, Miss., are that of

the Hoosic River in Massachusetts and the Kalamazoo River in Indiana.

The Kalamazoo River model is 100 feet long and follows a serpentine course composed of three curves with super-elevated floors, much like the actual river's course. The model's walls are $\frac{1}{2}$ -inch overlaid fir plywood, 12 inches high sloped at a 45-degree angle; its width from 2 to 3 feet.

The Hoosic River model, 200 feet long and from two to three feet wide, has seven super-elevated curves along its course. Its height varies from 9 to 12 inches.

Both hydraulic models have measured inflows of water, reproducing prototype quantities, at the upstream ends. Water discharge is controlled at the downstream ends by a tailgate that insures proper water surface elevations.

Water, flowing through the models by gravity, is circulated by motor-driven centrifugal and axial flow pumps that transport water from sumps to the upper ends of the models. The inflow is controlled by valves and measured by Van-Leer weirs, V-notched weirs, and Ventura meters. The water quantity required to operate each model varies. For example, actual maximum discharge in the Kalamazoo model is 1.1 cubic feet per second, or about 465 gpm. To fill the model's channel, headbay, and tailbay, 1,388 gallons of water are required.

The maximum pressure exerted against the plywood used in both models is comparatively small—in the Kalamazoo river model, pressure is about 0.162 psi, and 0.433 psi in the Hoosic river model.

Construction of models

Both river models have a high density overlaid fir plywood, a smooth durable fused resin-fiber surface material. Both models' channel floors have $\frac{1}{2}$ -inch high density overlaid fir plywood, and $\frac{5}{16}$ -inch walls.

Six-foot 4×4 's support both river systems, over which 4×8 -foot panels of $\frac{1}{2}$ -inch exterior-type fir plywood serve as a river bottom base. Both models' channel walls are braced with 1-inch thick 1 to 4-inch triangular braces fastened to the plywood base floor and walls. Where the floor and wall joined, $\frac{3}{4}$ -inch chamfer strips were imbedded in 3M rubber base cement to prevent leakage.

Plywood was used because its smooth surface offered a friction equal to an actual river bank, and the material is not affected by water or weather. The plywood's flexibility enabled it to be used for the model's curves. No special tools were required to work the material.

THE END

"HCMS" EARTH-BORING MACHINE, Skid-Mounted. Digs the hole in any type of soil . . . 9 to 36 inches in diameter up to 10 feet deep . . . and sets the pole. Powered by a separate engine mounted integrally on steel skids. Entire machine may be quickly mounted or removed from truck platform.

"PCP" COMBINATION TRAILER. Combination pole and cable reel trailer. Bolsters with sliding cam-locking stanchions are quickly mounted or removed as required. Cable reel saddles can be attached quickly and securely. Adjustable to different width reels.

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SWING-BASE EARTH-BORING MACHINE. Swing base allows rotation of the boring machine 180° — plus extension up to 22 inches. Provides a nearly infinite number of digging positions. Hydraulic operation. Truck-mounted. Extreme flexibility and exact positioning regardless of location or angle.

"B" HYDRAULIC EARTH-BORING MACHINE. New Highway digger is completely hydraulic in operation. Pressure-feed—digs through frost and hard-pan. Can be used either front or rear mounted...with any hydraulic derrick. Unit is self-storing. Lays across roof, takes no space on body.

UTILITY DIVISION HIGHWAY TRAILER COMPANY

HEADQUARTERS: EDGERTON, WISCONSIN

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SALES AND SERVICE IN PRINCIPAL CITIES

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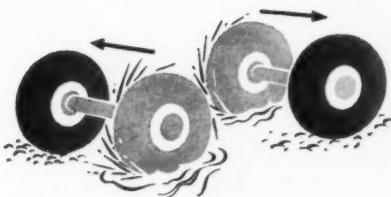
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There's more punch — more push — more penetration with a "PAYLOADER" because automatic power-transfer differentials assure better traction in adverse conditions — on loose underfooting, sand, mud, snow and ice. If one wheel slips, more power is automatically transferred to the opposite wheel, enabling a "PAYLOADER" to keep driving forward, where ordinary tractor-shovels spin helplessly. You get traction and *action* instead of wheel-spinning, time-and-power-wasting *inaction*.

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63



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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 219

Two canals dug to build up a road through Louisiana swamp

Digging two canals to build a road may not seem like very good logic, but it was the only feasible way to construct a stable embankment for a highway through a section of Louisiana swampland.

The 22-mile, \$4 million project will provide a new roadbed for U. S. 51 along the west side of Lake Pontchartrain from the Bonnet Carre Spillway to high ground near Pontchataula.

One of the canals, lying adjacent to the old road, was part of the borrow pit used to build the old road. It had to be dredged free of muck and debris down to reasonably firm clay to provide the foundation for the new highway fill. This trench ranged from 8 to 15 feet in depth and from 150 to 300 feet in width. Most of it parallels the old roadway, but there was some new alignment.

The second canal is the new borrow canal located 500 feet to the west of and parallel to the highway. This canal is a minimum of 60 feet in width and 7.5 feet in depth, and it provided access for the dredges that placed the fill.

When the roadway trench has been cleaned, the dredges moved along the canal, pumping the clay fill into the roadway trench to build the new grade.

A 13.75-mile section, beginning at the south end of the project near Frenier, was constructed by a joint venture of Jahncke Service, Inc., and McWilliams Dredging Co., both of New Orleans. This \$3.14 million contract called for the placing of more than 3.5 million cubic yards of the hydraulic embankment.

North of Manchac, the remaining 8 miles of the project was under contract to T. L. James & Co., Inc., Ruston, La. Dredging operations in this section were sublet to F. J. J. Sloat Dredging Co., Slidell, La., and Sabine Dredging & Construction Co., Port Arthur, Texas. More than 1.5 million cubic yards of embankment were placed under this \$1.22 million contract.

With the two general contracts and a number of subcontractors all at work at the same time, there were many pieces of equipment on the job. At one time, at least eight floating dredges, owned by almost that many



As big dredges strip the borrow canal, smaller ones like the 10-inch hydraulic Gary Bernard of Sabine Dredging Co., clear muck from the bottom of the roadway trench. This had to be removed down to sound material, which was used as fill for the new grade.



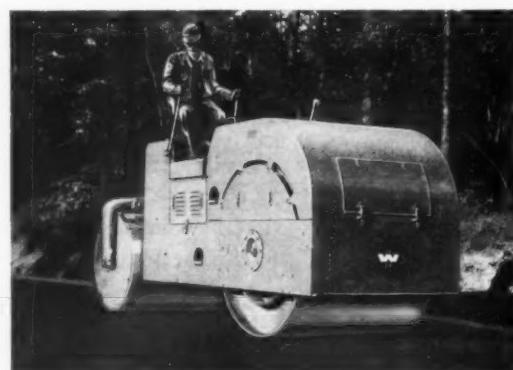
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**Dredges place 5,000,000 cubic yards
of hydraulic fill to build 22 miles of
highway through cypress swamp**



The hydraulic dredge, Moreland II, working for F. J. J. Sloat Dredging Co., Slidell, La., pumps fill from the borrow canal for the roadway. This dredge, with an 18-inch discharge line, was one of several working to complete the fill on time.

Gary
enrich.
new

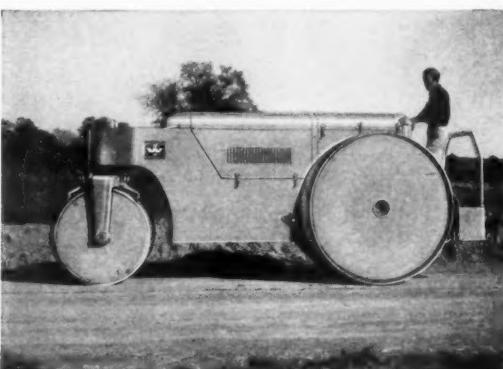
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Why Huber-Warco?

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Beginning with the introduction of the world's first motor grader in 1921, other firsts include; producing the world's first automotive-type motor roller in 1923, the first hydraulically controlled motor grader in 1926, first to offer a grader with torque converter and power-shift transmission, as well as the world's most powerful motor grader in 1955.

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MARION, OHIO, U. S. A.

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APRIL, 1957

different dredging companies, were at work. In addition, there were several barge-mounted crawler cranes, as well as cranes and other equipment, working on land. It was difficult to determine by observation just who was doing what.

The old roadway had been built many years before by simply dredging up unselected material from the swamp to form the embankment. This fill settled unevenly but consistently through the years, forming a very uneven roadway surface. And as the roadway settled, the many bridges and smaller drainage structures—which were more securely founded—remained at original grade. Gradually, these structures became a series of sharp humps in the grade.

A few years ago, a bridge-lowering project was conducted to bring these structures down to match the roadway. This, however, provided only temporary relief, since the roadway continued to settle. As it did not seem feasible to try to rebuild over this old roadbed, this new project was initiated to provide an entirely new grade for this entire section of highway.

Clearing

Clearing the dense jungle-like growth of cypress, other trees, and underbrush from the roadway, canal, and borrow-pit areas was the first major undertaking. A combination of draglines, tractor-dozers, chain saws, and plenty of hand labor were needed for this job. After the roadway had been cleared of trees and brush, it had to be grubbed so that the small hydraulic dredges could remove the undesirable muck. The borrow canal was simply cleared of trees and brush to admit the big bucket dredges that did the stripping.

Jahncke and McWilliams sublet some of the clearing to Monroe-Wolfe, New Orleans, which used three draglines and two dozers on the work. In most of the areas, the Caterpillar D7 tractor-dozers found good enough footing to keep from getting mired down too often as they pushed over the trees and brush. The draglines operated from barges, or on mats on the ground, grubbing the stumps and stacking all of the cleared materials

(Continued on next page)

(Continued from preceding page)



The 14-inch dredge, Tennessee, of Circle Dredging Co., New Orleans, La., works in the canal. It has a 14-inch suction line and a 12-inch discharge. It is powered by a GM 500-hp diesel. Its 60-foot ladder has a basket cutter powered by an electric motor.

in huge stacks for burning. Koehring 1 and 2-yard machines and a Lima 2-yard crane, all with clamshell buckets, were used.

The prime contractors also did some of the clearing and grubbing with a Caterpillar D6 dozer, a crane, and a barge-mounted Bucyrus-Erie Monighan 6-yard dragline. Since much of this cleared and grubbed material was completely saturated, a great deal of time and effort was required to get it stacked, dried, and burned.

Strip borrow canal

Among the dredges stripping the borrow canal were two rather unusual machines. One of these was the

Great Lakes Dredge & Dock Co. clamshell dredge, Conical, whose 240-foot boom of aluminum and steel made her conspicuous above the dense growth of the swamp. The other was the clamshell dredge, Grosse Tete, belonging to L. P. Davis Construction Co., Chalmette, La. The latter is unusual because of the way her boom is swung. The Grosse Tete is one of the two gravity swing dipper dredges known to be still in operation in this country.

The 105-foot boom of the Grosse Tete handled a Yaun 2-yard round-nose dredging bucket on this operation. Muck, stumps, and roots were excavated down to about 8½ feet below water to clear the borrow areas for the hydraulic dredge. In most of these areas, it seemed that the stripping consisted almost entirely of roots and stumps. It was difficult to get good loads in the bucket, but the very fast-acting gravity swing helped compensate for the smaller bucket loads.

On this rig there is no swing mechanism. The boom swings on a pivot at the front of the dredge hull. When in perfect balance, it hangs straight forward. The lifting and closing lines of the clamshell bucket are attached to sheaves on opposite sides of the boom. Shifting the bucket weight from one of these to the other causes the boom to swing. The efficient operator of the dredge had the boom swinging back and forth at a rate of two complete trips per minute in a seemingly effortless cycle.

Power for the operation of the dredge was supplied by a General Motors 6-71 diesel engine through a Clyde 6-drum hoist. The 34×100×5-foot hull carries three 16-inch square timber spuds, 45 feet long. Living quarters for the crew are included in the superstructure.

The Conical, a huge machine by comparison, gets its name from the 52-foot-high cone that supports the roller bearings for the dredge's revolving frame. A Busch-Sulzer 1,000-hp diesel engine is the prime source of power, while independent motors drive each of the operating units. The 240-foot boom of the Conical handles buckets ranging from 6 to 12 cubic yards, depending on conditions.

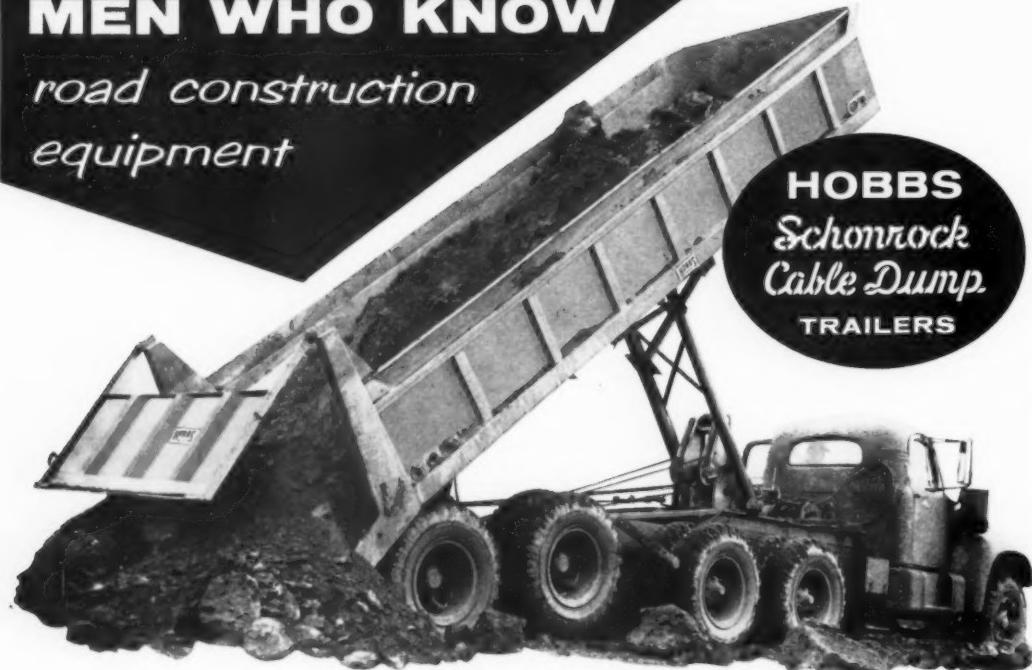
Clean roadway trench

While big dredges were stripping the borrow canal, a group of smaller hydraulic dredges were removing the muck from the bottom of the roadway trench. Most of this required excavation had been deposited in the trench since the first roadway was built.

It was also necessary to remove some native material to get the bottom of the trench down to reasonably sound material. Even this acceptable material was hardly what roadbuilders prefer for highway subgrades. One of the principal criteria for determining what had to be excavated and what could remain was that the material remaining could not contain more than 20 per cent organic material. In most cases, the subgrade

(Continued on page 32)

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NEW GUARANTEED AVAILABILITY PLAN

an air tool on free loan if your Blue Brute needs repair

The most important thing about an air tool is to keep it out on the job working. That's why Worthington Blue Brute tools are built for ruggedness—for ability to stand up under day-in, day-out punishment.

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will lend you an air tool free if any of your handheld Blue Brute tools is in our shop for repair.

To be sure the tool you need is there when you need it, we have recently enlarged our stock of standard air tools and accessories. We also carry a large inventory of parts so that repairs or replacements can be made quickly and inexpensively on all Worthington Blue Brute tools.

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For details about the new Availability Plan see a participating Blue Brute distributor

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A. W. Thomas Construction Machinery—North Miami
Highway Equipment & Supply Company—Orlando

GEORGIA Tractor & Machinery Company—Atlanta

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Capital Tractor & Equipment Co.—Morton, Springfield

INDIANA Reid-Holcomb Company—Indianapolis, Evansville,
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MICHIGAN Great Lakes Equipment Company—Muskegon

MINNESOTA Minneapolis Equipment Company—Minneapolis

MONTANA Caird Engineering Works—Helena

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NEW JERSEY Miller Equipment Company—Dunellen
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NORTH CAROLINA Spartan Equipment Company—Charlotte

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RHODE ISLAND BMG Equipment Company—Providence

SOUTH CAROLINA South Carolina Equipment Co., Inc.—Columbia

SOUTH DAKOTA Sioux Road, Inc.—Rapid City, Sioux Falls

TENNESSEE Carey Equipment Company—Memphis

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VIRGINIA Cary Hall Machinery Company—Salem
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WYOMING Keremi Tractor & Equipment Co.—Cheyenne, Casper

CANADA Precision Machine & Foundry—Calgary, Alberta
West Coast Equipment, Ltd.—Vancouver, British Columbia

For more facts, write dealer or circle No. 223



(Continued from page 30)

was a reasonably firm clay.

Most of this muck removal was done with small 8 and 10-inch dredges. One of these small dredges was the Gary Bernard, a 10-inch hydraulic dredge belonging to Sabine Dredging & Construction Co. The dredge's 10-inch sand and gravel pump was powered by a General Motors 6-110 diesel engine. All other operations were handled by electric motors powered by a Caterpillar 40-kw generator set.

A 20-hp electric motor drove the 5-blade basket cutter, which was fitted with guards welded between the cutter blades to prevent larger pieces of wood from getting into the suction line and the pump. A 7-drum shop-made hoist, powered by a 10-hp motor, handled spuds, ladder, swing lines, and anchor booms. All controls were air-operated.

To carry the excavated muck to the side of the roadway, the Gary Bernard used a spill barge fitted with a 90-foot cantilevered discharge line. As the dredge operated from the center of the channel, this long line discharged the muck and water at the extreme edge of the cleared roadway, where it could flow off into the swamp.

Removal of the cypress stumps and logs from the roadway trench was the job of a barge-mounted Koehring crane. The wood was picked up and piled on the rear of the barge by the clamshell bucket of the crane as a towboat moved the barge along the waterway. This material was then stacked on shore and later burned.

Dredges build fill

A number of hydraulic dredges of various capacities excavated material from the borrow canal and discharged it in the highway embankment. With most of the 5 million cubic yards of embankment to be placed in a few months, it was necessary to use a number of machines.

One of the first dredges at work on the embankment was F. J. J. Sloat Dredging Co.'s 20-inch dredge, Moreland II. Its 690-hp Fairbanks-Morse diesel is directly connected to an Amsco 20-inch pump that turns at 300 rpm. The 65-ton ladder carries a 5-blade Amsco basket cutter driven by two 50-hp motors. Two 150-hp Superior diesel generator sets supply auxiliary power, one operating the

The discharge line of the Moreland II brings fill in the roadway trench up to grade. The material placed is largely clay. At left is the existing highway; the new roadway is being built in the trench beside the old road.

cutter while the other supplies all other needs.

The Moreland has a 5-drum hoist to handle the 24-inch round spuds together with the swing and ladder hoist lines. On this job, the Moreland II pumped through an average of 1,500 feet of 18-inch discharge line. Of this, a maximum of 500 feet was floating line equipped with Mobile ball-and-socket joints.

On the Jahncke-McWilliams spread, the largest dredge was the 20-inch Natchez. Powered by a Nelseco 1,250-hp diesel engine, the Ellicot 20-inch pump picked up the material through a 24-inch suction line discharging into the embankment through a 20-inch discharge line. The 65-foot lad-

der, fitted with a basket cutter, enabled this dredge to excavate as much as 50 feet below the surface when this was desirable. The 44×130-foot hull draws up to 6½ feet of water and is fitted with living quarters for the crew on the upper deck.

Another dredge of almost this same size was the all-steel Paul F. Jahncke, a 20-inch hydraulic dredge belonging to Jahncke Service, Inc. The 20-inch Mobile Pulley & Machine Works pump is driven through a reduction gear by a GM 900-hp diesel engine. The 71-foot ladder on the bow of the 32×130-foot hull carries a 5-blade 60-inch manganese-steel basket cutter. Mobile hoists powered by Ideal electric motors and controlled by

Announcing the AUTOCAR

A rugged off-highway dump truck with planetary-gear rear axle . . . capable of handling 15-ton payloads at speeds up to 39 mph





Welded to the cutter of the Gary Bernard are guards that keep trash and larger pieces of wood from getting into the suction line and pump.

Westinghouse air controls operate swing gear, spuds, ladder hoist, and anchor booms. The floating 20-inch discharge line consists of Spiralweld pipe connected with Mobile ball-and-socket joints.

Making a good showing for herself and her owners, the Circle Dredging Co., New Orleans, was the diesel-powered Tennessee. Powered by a GM 500-hp diesel engine, the Morse dredge pump has a 14-inch suction line and a 12-inch discharge. The 60-foot ladder carries a basket cutter powered by an electric motor. A 7-drum American hoist driven by an electric motor handles the hoisting and swing gear. Auxiliary power was supplied by a Cummins 200-hp diesel

engine driving an Allis-Chalmers 150-kw generator.

Another dredge of about this same size, which operated in both the roadway trench excavation and in the placing of the hydraulic embankment, was the 12-inch L. C. Gibbs owned by Sabine Dredging & Construction Co. A Caterpillar D397 engine drove the Thomas sand and gravel pump while a Cummins 75-kw diesel generator set supplied power for the cutter motor. Auxiliary power was developed by a Buda 60-kw diesel generator set.

These and other dredges worked around the clock to bring the embankment up to grade. It now has a 44-foot top with 8 to 1 slopes on the east side toward the existing road and 15 to 1 slopes on the west. Under subsequent contracts, when the fills have become stabilized, select material and base courses will be placed preparatory to paving.

Personnel

Supervising the Jahncke-McWilliams job for the Louisiana Department of Highways were project engineer Reid Day and his assistant Henry Saacks. Dan McCarty, project engineer, did the same for the T. L. Jones spread. R. H. Vaughan is maintenance and construction engineer for the department, and E. J. James, chief engineer.

Supervising the project for the Jahncke-McWilliams combine were M. R. Fridge and Adolph Landry. Supervisory personnel on some of the dredges included Capt. A. R. Willis, in charge of the Moreland II; B. C. Davis, of L. P. Davis Construction Co., in charge of the Grosse Tete; Capt. B. Roux and chief engineer N. Broussard, the Gary Bernard; Steve Bertrand, captain, and Adam Dugas, chief engineer, the Tennessee; and Henry Ausley, captain, and Stanley Jones, chief engineer, the L. C. Gibbs.

THE END

WHAT ARE THE ADVANTAGES OF THE AUTOCAR PLANETARY AXLE?

1. First and foremost, it provides long gear and shaft life for a giant truck.
2. It decreases torque load on axles and differential.
3. Owing to multiple gear-tooth contacts, it provides high torque capacity.



GOOD GROUND CLEARANCE, TOO. By dividing the axle ratio between the gear carrier mounted at the center of the rear axle and the planetary reductions at the outer ends we reduce the main drive gears in diameter and gain substantially greater ground clearance under the housing bowl.



15 TONS AT 39 MPH. The AP-15 hauls its big payload at 39 mph. It permits a fast trip cycle and thus hauls many more tons per working day.



AUTOCAR DRIVER CAB AND POWER STEERING make the AP-15 easy on the driver. The Driver Cab with its fully adjustable seat, form-fitting back, and accessible controls permits the driver to handle this hardworking truck all day long and like it.

AND, THIS AUTOCAR IS BUILT TO LAST Nuts and bolts instead of rivets throughout. Reinforced, heat-treated alloy steel frame for flexibility as well as great strength. Replaceable bushings to save wear on more expensive major components. For hauling fill, rock, potash, copper or coal, you can't beat this big Autocar AP-15. Ask your White-Autocar dealer for further information or write direct to us.



Dump bodies, hoists

■ A catalog describing the company's medium-duty dump bodies and arm-type hoists is available from Gar Wood Industries, Inc. Bodies for various hauling needs are pictured with all the special accessories for the particular jobs described.

Arm-type and direct-lift hoists, as well as the popular conversion hoists, are illustrated and detailed. Specifications for hoists with capacities ranging from 6 to 12 tons are also outlined.

To obtain this brochure write to Gar Wood Industries, Inc., 3625 Michigan Ave., Wayne, Mich., or use the Request Card at page 18. Circle No. 112.

Branch office for Bendix

A Midwestern regional office has been opened by the Bendix Computer Division, Bendix Aviation Corp., Los Angeles, Calif. Located at 919 N. Michigan Ave., Chicago, Ill., the new office will be managed by Robert C. Whiting.

Construction of 41,000 miles of interstate roads to serve a growing population that uses more and more vehicles is a mark of the rapidly changing times. Along with this development goes a gradual change in roadside development. As work gets under way on highways included in the interstate system, extra effort

must be exerted so that roadside planting of these access expressways is done for the sake of utility, safety, beauty, or economy.

Planting to serve public

Planting may be done mainly for utilitarian purposes. Such planting as is done to provide safety turnouts,

scenic overlooks, and rest areas complete with picnicking and sanitary facilities provides a service for the traveling public. These areas are needed for use by both passenger cars and trucks on the Interstate System. They will provide safe, attractive, and restful stopping places where motorists may relax or enjoy the countryside.

A considerable amount of seeding and planting will have to be done in the construction of these areas as roadways and footpaths and parking and sanitary facilities are built. It will be desirable to plant trees to provide shade, since motorists prefer to park in the shade on a hot summer's day. Low ground cover in the form of woody shrubs or vines may be used on cuts or fills in preference to grass, as such treatment not only reduces the need for the continual maintenance cost of mowing, but also improves the appearance of the area. Planting may be used to guide traffic into and out of a roadside rest area. It may be desirable to provide screen planting at certain locations on the site.

Fencing against cattle and other animals, or to keep motorists from trespassing on adjoining lands may consist of living fences of small growing trees such as the Cockspur Hawthorne or Thicket Hawthorne, and such shrubs as the Japanese rose and Virginia rose. Low planting in the vicinity of shelters constructed at roadside rest areas is appropriate. In general, plant material selected should be nursery-grown, hardy, long-lived native trees, shrubs, and vines indigenous to the locality.

Where these new highways go through urban areas, many residential communities will be affected by the construction. Extensive screen plantings of deciduous trees and shrubs and coniferous trees and broadleaf evergreens will provide an attractive vegetative buffer that will reduce the traffic noise, dust, and fumes. Border plantings of this type have helped overcome resistance to the construction of new highway facilities in a number of neighborhoods. Planting has helped not only to beautify a community, but to stabilize and protect real estate values against loss due to the traffic nuisance.

Planting for safety

Functional planting for highway safety has had conspicuous success in the use of a living screen to cut down on headlight glare from oncoming traffic and to guide traffic. This type of screening has proved effective on the Merritt Parkway in Connecticut, the Henry Hudson Parkway in New York, and the Garden State and Palisades Interstate parkways in New Jersey. Many other states such as California, Illinois, Kansas, Louisiana, Minnesota, North Carolina, Oregon, and Virginia have done varying amounts of this type of planting and reported excellent results.

Planting the narrow median with informal masses of small trees and native shrubs not only eliminates headlight glare but also provides safety barriers against head-on col-

Functional roadside planting

by OLIVER A. DEAKIN

Parkway and landscape engineer
New Jersey State Highway Department



Get any Gates Hose quickly from your nearby distributor

There is a distributor of Gates Construction Hoses conveniently located near you. That means you can get quickly the right hose for any construction job.

Here are three Gates Hoses popular with construction men for their complete dependability and ready availability:

500SB Gates Heavy Duty Water Suction Hose with maximum crush resistance

Recommended for use on 4", 5" and 6" centrifugal, diaphragm and piston type pumps, this heavy duty hose has rugged spring steel wire and strong fabric reinforcing to make it practically crush-proof. Tube is compounded to handle abrasive fluids such as those encountered in sewer work. Made with inside diameters from 2" to 6".

39WW Gates Water Suction Hose withstands extremely rough usage

An all-purpose heavy duty suction hose for use on intake side of any pump requiring hose up to 4" inside diameter. (Can also be used for discharge service.) Tough but flexible. Reinforcing wires and cords are interlaced to provide a strong, well-balanced construction.

35B Gates General Purpose Water Hose for long life in rough service

A superior hose for all types of wet-down service... for concrete making... for discharge on small pumps. Top quality black rubber cover is built to withstand rough usage and exposure to weather — won't chip or scuff off. Tightly twisted cords provide rugged reinforcement — permit use of high water pressures. Heavy gauge tube compounded for long service... Available in long, continuous lengths — 1/2" through 1 1/2" inside diameters.

Gates Construction Hoses are conveniently available. Consult the yellow pages in your phone book for nearest distributor.

The Gates Rubber Co., Denver, Colo.

TPA 163

The Mark of  Specialized Research

Gates Construction Hoses

For more facts, use Reader-Reply Card opposite page 18 and circle No. 225

lisions. Japanese rose and other shrubs are capable of stopping vehicles that crash into the planting at 50 mph without causing any injuries to the passengers or driver. Similar plantings may be used as a substitute for a costly guard fence that requires yearly maintenance from the time it is erected on the roadside.

Plant material has also been used effectively to delineate changing alignments. Trees and shrubs planted on curves help make a highway safer for travel, especially at night, and more relaxing and comfortable for daytime driving. Mountain laurel, Inkberry, Bayberry, and Japanese rose have all been used effectively in planting for safety. Hall's Japanese honeysuckle has been used on mounded medians on the Garden State Parkway in New Jersey to help stabilize the mound as well as provide a semi-evergreen ground cover that requires little maintenance as compared with grass.

Landscape for beauty

Proper landscape planting design has, in many instances, restored and even increased the beauty of the roadside. This planting can be kept to a minimum by the adoption of adequate conservation practices by the state highway departments when the location and design work is done for a highway. Adequate use of native trees, shrubs, and ground covers will contribute a great deal toward creating an ever-changing, interesting roadside landscape that will relieve monotony and driver fatigue.

Once planted areas are well established, they require little maintenance. They should be fertilized periodically so that a vigorous and healthy growth is maintained, since slow-growing, half-starved plantings detract from a roadside.

The look of highway structures such as bridges, signs, maintenance buildings and yards, and stockpiles of road maintenance materials may all be improved by planting. By using adequate planting design, all of these things may be made to harmonize more completely with the surrounding landscape.

Maintenance cost economy

Economy in maintaining the roadside is essential. It has been found that high cut slopes and embankments may be stabilized most economically by the use of vegetative cover. Native trees, shrubs, and ground cover have succeeded with their deep-growing root systems, while turf cover has failed. This is particularly true on cut slopes underlaid with clay. Ground cover such as Hall's Japanese honeysuckle and Bittersweet will reduce maintenance cost to a minimum once the planting has become established on slopes and embankments. The yearly maintenance saving attributed to the elimination of expensive mowing on difficult slopes will quickly pay for the initial cost of the plant material.

Live snow fence plantings of red pine, white pine, and Austrian pine have replaced miles of wooden snow fence erected yearly in Minnesota and

Michigan. In Minnesota, the seedlings were furnished by the State Forestry Division.

Maintenance savings per mile in Minnesota is \$539 as compared with the standard slat-type snow fence. The per mile saving in Michigan maintenance costs comes to \$476. Such live snow fence plantings not only reduce maintenance costs but greatly enhance the appearance of the roadside.

Plant material may be used effectively to provide living fences along right-of-way lines to keep pedestrians and animals from crossing the roadways. Plantings of this type may be purchased and planted at lower cost than steel wire fencing. The maintenance repair of steel wire fencing is much more expensive than

maintaining a hedge planting of appropriate plant material. Live fences have the additional advantage of improving the beauty of the roadside while wire fencing gradually deteriorates and becomes unsightly.

Design standards that create increased beauty, safety, utility, and economy should be the goal of those working on the roadsides of the new Interstate System. If such design standards are achieved, they will prove one of the best means of reducing accidents, increasing comfort, and making travel more pleasant on the expressways of tomorrow.

THE END

Traffic deaths in 1956 increased 4 percent, resulting in a higher all-accident death total for that year.

Fordham Law Review deals with building contracts

One of the leading articles of the Fordham Law Review discusses "Federal Government Contracts: Liability for Delays Caused by the Government". Written by E. Manning Seltzer and Albert M. Gross, both of the U. S. Army Corps of Engineers, the article covers cases establishing governmental liability where the government acts in its sovereign capacity, an analysis of instances where liability will be found, and equipment delays.

Another article treats with bad faith in negotiable instruments.

Priced at \$1, the book may be purchased from the Fordham University School of Law, 302 Broadway, New York 7, N. Y.



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Use Sinclair SUPER TENOL® to save your Diesels from the harmful and costly effects of severe operating conditions. Sinclair SUPER TENOL is specially engineered for the tougher jobs! It saves engines by combating the effects of high temperature, over-loading, and continuous stop-and-go service. It helps eliminate deposits of varnish, carbon and sludge that impair engine efficiency. Experience shows that Sinclair SUPER TENOL keeps equipment on the job longer with less wear and fewer repairs!

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 226

names in the news



Herbert C. Savin,
new vice president of
Merritt-Chapman & Scott Corp.

New M-C & S vice president

Herbert C. Savin has become a vice president of Merritt-Chapman & Scott Corp., New York, N.Y., for the company's construction department. Previously, Savin served as a vice president of The Savin Construction Corp., East Hartford, Conn., which operates as a part of the M-C&S construction department.

WBPA opens new office

The Wisconsin Bituminous Paving Association has opened permanent offices at 1 W. Main St., Madison, Wis. Edward J. Konkol, who was formerly executive secretary of the Wisconsin Good Roads Association, will be in charge of the new office.

The association will carry on a program acquainting the public, and state, county, and city officials with the composition and use of bituminous concrete, its economy in use and

L. M. Hayes, president of the Wisconsin Bituminous Paving Association.



construction, and the many safety features that result from the use of flexible highway materials. The organization will also stimulate and encourage extensive research relative to the manufacture and use of bituminous concrete, and will stress the economy to the highway user and taxpayer through the use of asphaltic materials.

Officers of the association are: president, L. M. Hayes of the Rock Road Construction Co., Madison, Wis.; vice president, R. L. Miller, Reliance Construction Co., Sheboygan, Wis.; and secretary-treasurer, L. W. Kahl, Rein & Schultz, Madison, Wis.

Officers elected to NSGA

Roy E. Weaver has been elected president of the National Sand and Gravel Association for 1957. Weaver is with the Lincoln Sand and Gravel Co., Lincoln, Ill. Vice president of the organization is E. Phil Gemmer of the Texas Construction Material Co., Houston, Texas. The new secretary-treasurer is E. K. Davison of J. K. Davison & Bro., Pittsburgh, Pa.

At the same time, 36 were elected to the board of directors.

Two retire from B&O RR, H. Seitz promoted in job

Henry Seitz, formerly designing engineer of bridges and buildings, has been named structural engineer for the engineering department of the Baltimore & Ohio Railroad, Baltimore, Md. At the same time, Gurney H. Dayett, Sr., former assistant to the chief engineer, and John S. Knight, regional engineer at Chicago, have retired.

Seitz, a graduate of the Baltimore Polytechnic Institute, has been with the B&O for the past 37 years. He is a registered professional engineer in

Maryland, and is a member of the American Society of Civil Engineers and the American Society of Testing Materials.

Dayett, a civil engineer from Lehigh University, joined the company in 1922. He is a past president of the Maryland section of the American Society of Civil Engineers and the Engineers Club of Baltimore. He is also a member of the American Society of Testing Materials.

Knight has held posts of increasing importance since joining the B&O in 1910. He is a member of the American Railway Engineering Association and of the Western Society of Engineers.

Fla. turnpike appoints acting chief engineer

Jack R. Swaine has been appointed acting chief engineer for the Florida State Turnpike Authority, Fort Lauderdale. Swaine, a veteran of 22 years in the Florida State Road Department, has served as chief of the turnpike authority's testing laboratory for the past two years.

Swaine replaces Sam P. Turnbull, who resigned. Turnbull, a former chief engineer of the Florida State Road Department, was chief turnpike engineer for the past two years. Turnbull is now engineer-director of

P&H

¾ yard P&H 255A crawler machine quick-loading a ten-wheeler at Portland, Maine

the Florida Road Builders' Association, Inc., Tallahassee.

Twaits Co. changes name to Twaits-Wittenberg Co.

Ford J. Twaits and Carl H. Wittenberg, co-partners of the Ford J. Twaits Co., Los Angeles, Calif., have changed the firm name to Twaits-Wittenberg Co. The contracting and engineering firm is currently working on the multi-million dollar plant for the Ramo-Wooldridge Corp., and the \$18 million facility for Pacific Coast Borax Co., both in California.

The firm was established in 1919

as Scofield Engineering Construction Co., with Mr. Twaits as partner and general manager. In 1927, it became Scofield-Twaits Co., and seven years later it was established as the Ford J. Twaits Co.

NRMCA elects officers

The 1957 officers for the National Ready Mixed Concrete Association have been elected. John W. Roberts, president, is associated with the Southern Materials Co., Inc., Richmond, Va. M. Eugene Sundt and F. E. Schouweller are the new vice presidents. Sundt is with the Albuquerque

Gravel Products Co., Albuquerque, N. Mex., and Schouweller is with the Old Fort Supply Co., Fort Wayne, Ind. The newly elected treasurer, John B. Donovan, is with the Valentine Concrete Co., Inc., Springfield, Mass.

Thirty-two men were elected to the board of directors.

NCA elects officers

C. D. Haxby, vice president of the Rust Engineering Co., Pittsburgh, Pa., has been elected president of the National Constructors Association, of New York, N. Y. Carl B. Whyte, presi-



C. D. Haxby, left, president of the National Constructors Association; right, C. B. Whyte, vice president.

dent of Procon Incorporated, Des Plaines, Ill., was elected vice president. New members of the executive committee, in addition to the officers, are: Paul L. Wetcher, W. B. Poor, Paul S. Klick, Jr., H. A. Denny, and D. S. Pelletier.

NCA is composed of engineering and building firms engaged in the design and construction of chemical plants, petroleum refineries, steel mills, and power plants.

Anson elected AICE head

The American Institute of Consulting Engineers, New York, N. Y., has elected Edward H. Anson president, succeeding Carlton S. Proctor. Mr. Anson is senior vice president and director of Gibbs & Hill, Inc., New York, N. Y. The AICE also elected the following members of the governing council: E. Sherman Chase, Dean G. Edwards, and Emil H. Praeger.

Hercules Concrete names

Paul D. Schlenker has been appointed general manager of the Hercules Concrete Pile Co., Palm Beach, Fla., specialists in cast-in-place concrete pile foundations and sand drain installations. Schlenker, a member of the American Society of Civil Engineers and the Society of Military Engineers, has been active in foundation engineering and construction for the past 23 years.

Potgieter opens firm

Fred M. Potgieter, since 1946 vice president of the Mechanics Universal Joint Division of Borg-Warner Corp., Rockford, Ill., has opened a consulting engineers office in Rockford. The author of numerous technical articles, Potgieter is particularly interested in the mechanics of universal joints and their performance under test.

Rust Engineering news

Dr. Bernard J. Gaffney has joined the Rust Engineering Co., Pittsburgh, Pa., as the New York manager of the firm's office. Prior to joining Rust Engineering, Gaffney was the sales manager of the industrial chemical processes for the Chemical Construction Corp., a subsidiary of the American Cyanamid Co.

Brooklyn Polytech news

Effective September 1, Dr. Robert B. B. Moorman will be head of the civil engineering department of the Polytechnic Institute of Brooklyn, Brooklyn, N. Y. Dr. Moorman is now at Syracuse University.

For more facts, use coupon or circle No. 227

3/4 yd. shovel has a mighty appetite

P&H 255A—first 3/4 yd. power shovel--still the leader

P&H was the first to introduce a power shovel in the $\frac{3}{4}$ yard class and with today's P&H features the 255A continues to lead in profitable performance.

Contractors agree that the 255A with its dependable day-in and day-out production can dig more and lift more—faster and cheaper. In fact, many contractors agree that performance of P&H equipment is the big factor in determining their profits.

P&H profitable performance comes from a combination of features that are found only in P&H quality equipment. In the 255A you get famous P&H stability through better weight distribution and a low vertical center of gravity. You get

smooth, fast, lively swings on the mammoth P&H live roller circle. P&H designed double adjustable hook rollers assure "even keel" swings. The 255A makes maximum use of alloy steel.

Add to these features the fact that equipped with a P&H Diesel Engine with its greater torque you'll get much greater production than with a gas engine. Yes!—this $\frac{3}{4}$ yard excavator has the mightiest appetite for work—at a potential profit.

Harnischfeger Corporation
Construction & Mining Division
Milwaukee 46, Wisconsin

THE P&H LINE

Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 45 tons
Shovels: $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, $1\frac{1}{4}$, $2\frac{1}{2}$, and $3\frac{1}{2}$ yards

Across the country P&H machines lead the field in power, speed, flexibility, and profitable performance



CALIFORNIA

For handling loads up to 35 tons profitably there is the P&H 555A-TC. Here are Reliance Equipment's two 555A-TC units double lifting a precast concrete panel in the Vail Field Industrial Area, Los Angeles.



LOUISIANA

In the $1\frac{1}{2}$ yard class, Schwartz Supply Co. profits from the lively swings and dependable performance of the P&H 655B. It is shown unloading material for their concrete mixing plant near New Orleans airport.



OHIO

Beavercreek Excavating Co. of Dayton depends on their $\frac{1}{2}$ -yard P&H 155A trench hoe to dig water mains and lay pipe economically and at a profit on State Highway 4 project in Butler County.

Write today
For Bulletin X-71
On the P&H 255A
Fully Convertible
Crawler Machine

Harnischfeger Corporation, Dept. 509-C
Construction & Mining Division
Milwaukee 46, Wisconsin, U.S.A.

Gentlemen:
Please send me Bulletin X-71 on the $\frac{3}{4}$ yard P&H 255A

Name _____

Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

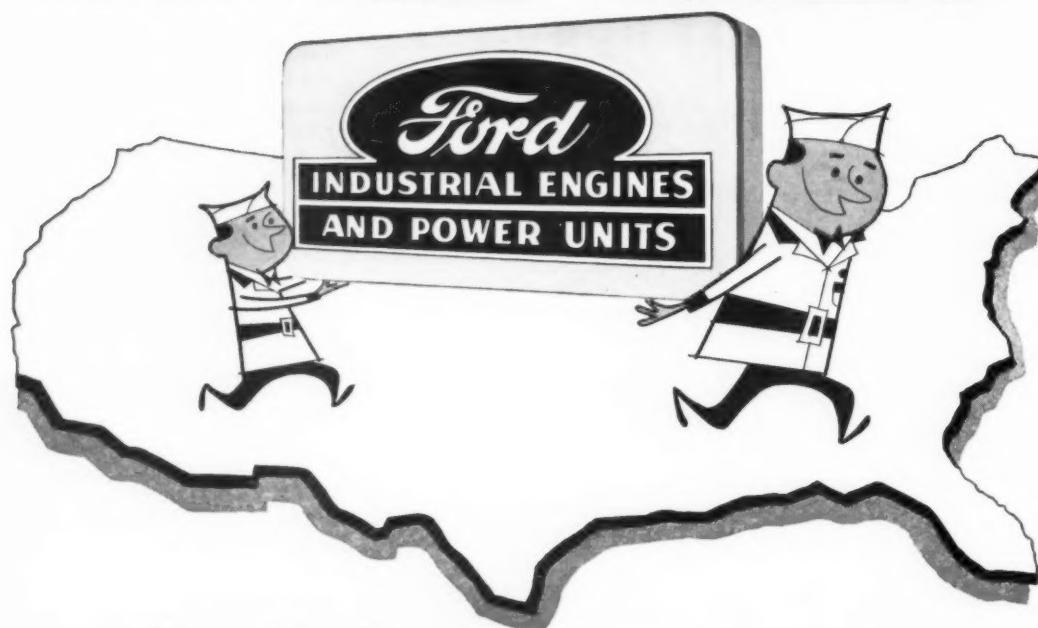
Unusual steel, concrete work build multi-wing airport terminal

Moving sidewalks carry passengers from main lobby to planes; brightly-colored baked-enamel metal panels form exterior walls



Working with a Chicago Pneumatic impact wrench, workmen tighten a high-tensile steel bolt on the framework. All field connections, made with $\frac{3}{4}$ and $\frac{7}{8}$ -inch bolts and washers, were checked with a torque wrench.

Whether it's repair or replacement...



You'll find Ford Industrial Engine Service is available everywhere!

Know why so many industrial power users are swinging over to Ford power? One reason is service.

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Also, across the country, you'll find a network of newly established Ford Industrial Power Headquarters. Each is equipped to repower any type of equipment with dependable, low-cost Ford power.

It's the availability of service like this—wherever you are—that helps keep your operating costs *low*. If you are considering a new power unit or engine assembly—4-, 6- or 8-cylinder—see your Ford Industrial Products Dealer. He will be very happy to

discuss your power requirements with you and make sure you get the one right power unit for *your* job. Write to the address below for further information.



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AND POWER UNITS

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P.O. Box 598, Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

For more facts, use Reader-Reply Card opposite page 15 and circle No. 228

Faced with baked-enamel metal panels, the new airport terminal building at Love Field, Dallas, Texas, is not only one of the most modern but also one of the most colorful of the major airport terminals in the country.

The \$6.5 million structure, covering some eight acres of ground, features such modern conveniences as moving sidewalks for passengers, a control tower rising nine stories above the ground, and complete air conditioning.

Construction contracts for the terminal were awarded by the city of Dallas to four prime contractors. T. C. Bateson Construction Co. had the largest part of the work in its \$4.14 million general contract; Fischback & Morre of Texas, Inc., held the half-million dollar electrical contract; Kieffer Plumbing & Heating Co. had the \$1.3 million mechanical contract; and E. H. Reeder Construction Co., Inc., installed the outside utilities and drainage. All four of these contractors are located in Dallas.

The moving sidewalks were furnished and installed by Hewitt-Robins, Inc., Passaic, N. J., under a fifth prime contract. The traveling walkways will carry passengers between the main passenger lobby and the boarding areas in the long fingers that extend out to the aircraft parking areas on the field. Starting at the ground level, the moving sidewalks rise up to overpass the baggage ramps, then underpass the passenger bridges between the lobby and the loading areas.

The huge multi-wing structure was designed by Broad & Nelson and Jack Corgan Associated Architects & Engineers of Dallas. The design firm also supervised the construction operations.

Main unit and wings

The main central unit of the terminal, measuring 286×240 feet rising to a 4-story height, is surmounted by a tower that reaches a height of 9 stories above the ground. The top floor of this tower will house the traffic control facilities for the field. The other floors of the tower and the upper two floors of the main building contain offices. The first two floors of this unit are the main passenger

Chicago wrench,
a high-
on the
eld con-
h 3/8 and
washers,
a torque



Forms for the reinforced-concrete bridges leading over the baggage ramp to the loading piers are supported on Waco adjustable steel shores resting on timbers on the concrete floor. Beam sides are formed with 1-inch-lumber, backed by 2 x 4 studs and double 2 x 4 wales and tied with Dayton snap ties.



Some of the final members of the steel frame are set by a truck-crane with 100-foot boom and 25-foot jib. The high steel in the 9-story control tower was set by a 35-ton guy derrick.

lobby, together with cafes and ticketing and baggage facilities.

Two wings projecting from the main unit away from the field contain ticketing and baggage-handling facilities. The baggage wing is 202 feet long and 49 feet wide, and the ticketing wing measures 300 x 63 feet. Both are of single-story construction.

Serving the aircraft-parking aprons on the field are three large units, called piers, which are connected to the main unit by passenger bridges. The west pier measures 420 x 72 feet and contains airline offices as well as passenger and baggage facilities. The east pier, measuring 260 x 43 feet, houses the cooling and power units in addition to the passenger facilities. These two piers are joined by a covered passenger bridge, 320 feet long, accommodating the moving sidewalks that will transport passengers to and from planes.

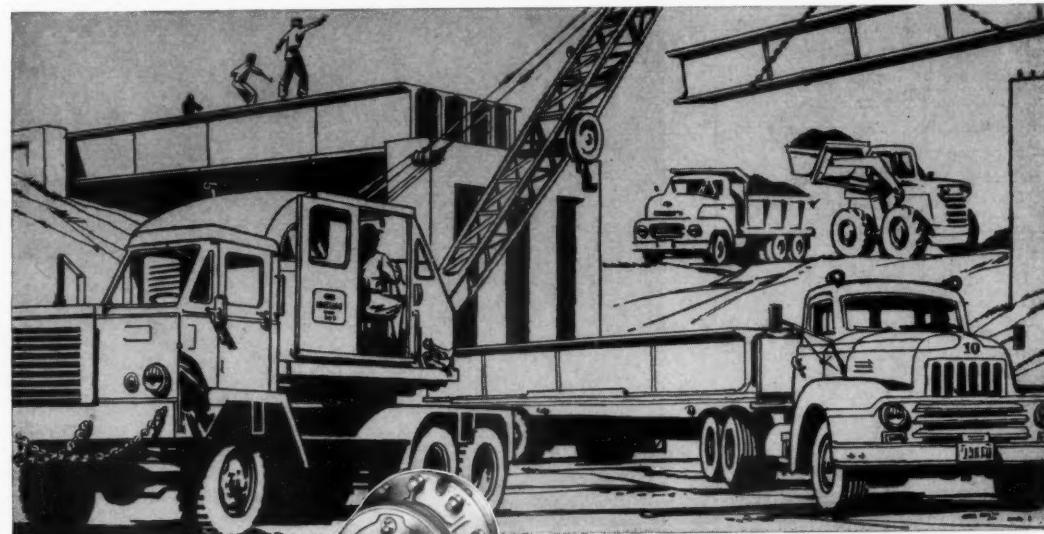
Extending out into the field to the north of the main unit is a 280-foot passenger bridge terminating in the 480 x 76-foot north pier. Provision has been made to extend this pier still farther to accommodate additional loading ramps by the construction of a 496 x 50-foot extension. Air mail and air cargo are to be handled from a separate 84 x 450-foot building.

The excavation for the basement of the main building and for footings was subcontracted by Henry Gray, Dallas. To dig the big hole for the basement, Gray brought in two Allis-Chalmers HD-20 tractors pulling Gar Wood 25-yard scrapers. An Allis-Chalmers HD-21 tractor and a Caterpillar D8 tractor push-loaded the scrapers and spread the material by dozing. A Unit backhoe dug out some of the smaller footings, while a Lorain TL-25 dragline with a Hendrix 3/4-yard bucket excavated for the passenger bridges and piers.

Drill and drive piles

The main unit of the structure is founded on Raymond concrete piles. Approximately 750 of the step-taper casings were driven by a Raymond crawler rig to an average depth of 40 feet. These were filled with concrete.

Other parts of the structure are supported on drill piles, most of
(Continued on next page)



Check the amazing performance records set by this unique

CLARK Planetary Axle

ideal final drive for

- Excavator-cranes and other heavy-duty industrial machines • Tractor Shovels, Bulldozers and similar construction equipment • Tandem Drive Units in all applications.

You've never, in all probability, seen anything quite like this extraordinary performer, for the reason that there isn't anything just like it.

Look at this record of the Clark Planetary Axle—

- 70% LESS TORQUE LOAD ON SHAFTS—planetary drive assembly takes 70 per cent of the torque load off the axle shafts. Result: shaft wind-up and surge are practically eliminated—and broken shafts are virtually unknown.

- LIGHTER WEIGHT—YET STRONGER—severest torque loads are handled easily by shafts and gears actually smaller in size and therefore consider-

ably lighter in weight than other axles of equal capacity.

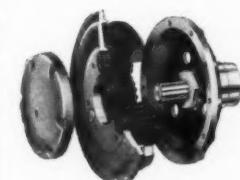
- ROAD SPEEDS UP TO 30 MPH—big time-savings in job-to-job travel.

Important: A number of operators, faced with difficult hauling conditions, have converted equipment of conventional type by installing Clark planetary axles—with remarkable success.

Doesn't it make complete good sense to find out about this remarkable piece of equipment—and how it may solve your problem? The coupon will get you prompt delivery of full information.



Primary Reduction in the center section, by helical bevel pinion and gear.



Second Reduction in the drive wheel—a sun gear splined to the axle shaft and three planet gears driving an internal gear in the inner periphery of the wheel, as close as possible to the point where tractive effort is applied.
Two types: steering and non-steering.

CLARK EQUIPMENT COMPANY • AXLE DIVISION, Buchanan 7, Michigan

Please send illustrated bulletin on the Clark Planetary Axle.

CLARK
EQUIPMENT

Name _____ Position _____

Firm _____

Address _____

*City _____ State _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 229



Bricklayers work from a Waco scaffold as they lay up a brick wall in the east pier section. This pier, measuring 260 x 43 feet, contains cooling and power units in addition to passenger facilities.



Foundations for the north pier, which extends far out from the main terminal building to serve the aircraft parking areas, are excavated by a Lorain TL-25 dragline with Hendrix 3/4-yard bucket. In the background is the steel framework of the terminal.

(Continued from preceding page)

which are founded on a sand strata about 15 feet below the ground surface. Saxon Foundation Co., San Antonio, Texas, drilled the holes, most of which are 24 inches in diameter and have bellied bottoms. The drilled holes were filled with concrete to complete the piles.

Basement walls were formed with $\frac{3}{4}$ -inch plywood backed by 2×4 studs and wales and tied with Dayton snap ties. Ready-mix concrete for these walls as well as other parts of the structure was supplied by Vilbig Ready Mixed Concrete Co., Dallas, and delivered to the job in Smith 6 and 8-yard mixers mounted on International trucks.

Sections which could be poured conveniently from buckets were placed with the use of a Bucyrus-Erie 22-B crane and a Byers 20-ton truck-crane using Gar-Bro $\frac{3}{4}$ -yard buckets. Whenever concrete could not be placed directly from the buckets, it was bucketed to a 2-yard hopper and then wheeled to the forms in buggies.

Basement columns were formed with Sonotubes ranging from 12 to 38 inches in diameter. The first floor of the main unit was poured on Ceco steel pans supported on Waco adjustable shores. Forms for floors above the first were supported directly from the structural steel building frame.

Derrick and cranes set steel

The 2,700 tons of structural steel in the building frame were supplied by Mosher Steel Co., Dallas, and erected under a subcontract by F. B. McIntire Construction Co., Fort Worth, Texas.

To build the tower section of the main building, the contractor set up a 35-ton guy derrick with a 115-foot mast and 95-foot boom. This derrick, powered by an American hoist driven by a Minneapolis-Moline engine, raised the steel for the central part of the main building and for the high tower.

While the guy derrick was raising the steel for the high portion of the building, two cranes—one of them a Lorain 30-ton rig—set the remainder of the steel. Both were fitted with 100-foot booms and 25-foot jibs.

All field connections in the building frame were made with $\frac{3}{4}$ and $\frac{7}{8}$ -inch high-tensile bolts and washers.



**Gets back
on new slab
sooner**

speeds paving schedules

KOEHRING 16-E *twinbatch*®

paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This reserve production capacity with *twinbatch*

Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts,

bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

See for yourself how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

KOEHRING Company
Milwaukee 16, Wisconsin

(Koehring Subsidiaries: JOHNSON • PARSONS • KWIK-MIX)

CONTRACTORS AND ENGINEERS

Bolting crews used Chicago Pneumatic impact wrenches to tighten the bolts, which were checked with a torque wrench.

This structure is one of the largest installations of baked enameled metal siding ever installed. The insulated metal sandwich panels for the exterior walls were furnished and installed by Texlite, Inc., Dallas.

Floors above the first and the roof deck were formed with Tufcor corrugated galvanized metal decking, over which the concrete floors were placed. The roof deck was built up with 3½ inches of lightweight insulating concrete, 1 inch of insulating board, and a multi-ply built-up roof.

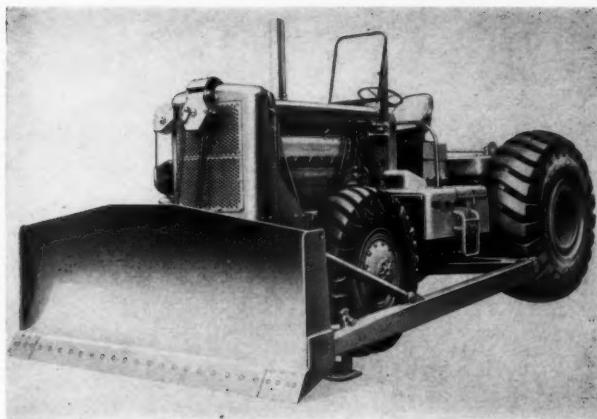
Throughout construction, a number of existing buildings on the terminal site had to remain in use until

portions of the new facilities were completed. Some sections of the terminal were actually rushed to completion and put to use before other wings were even started.

Personnel

Supervising the work for T. C. Bateson Construction Co. was general superintendent, J. B. "Jim" Franklin. His duties included the general supervision of the many subcontractors as well as the workmen employed directly by Bateson. J. V. Rigg was assistant superintendent. The project engineer for Broad & Nelson and Jack Corgan, the architects, was A. Shiro. Elgin E. Crull is city manager of Dallas, and George P. Cokes, Jr., is director of aviation.

THE END



The Cat No. 688 Series C tractor, newest addition to the company's line of wheel tractors.

Speed, traction combined in 4-wheel-drive tractor

A new 300-hp four-wheel-drive tractor that reportedly combines fast travel and work speed with high tractive effort has been added to the line of wheel tractors manufactured by the Caterpillar Tractor Co. The No. 688 Series C is designed primarily for powering scrapers and for bulldozing.

For bulldozer and pusher operation, a transmission providing eight forward and four reverse speeds is used, permitting speeds up to 26.3 mph. For scraper applications, a transmission with 10 forward and two reverse speeds is employed, with a top speed of 32.1 mph.

Engagement and disengagement of the front-wheel drive, powered through an auxiliary power train, is performed by a lever alongside the standard shift lever. It can be engaged or disengaged while the tractor is moving. With the front-wheel drive engaged, the No. 688 has a maximum rim pull in first gear of 34,140 pounds.

With bulldozer and cable control, the No. 688 weighs just under 22 tons; 60 per cent of this weight is carried on the rear tires. Additional weight as needed can be added by the use of counterweights, or by hydro-inflating the tires. Up to 7,500 pounds of extra weight can be added.

The No. 688S bulldozer attachment is 12 feet 10 inches wide and 53 inches high. Skid shoes, mounted on the draft arms, give the operator closer blade control by preventing too-rapid penetration. The bulldozer can be operated by cable or hydraulic controls.

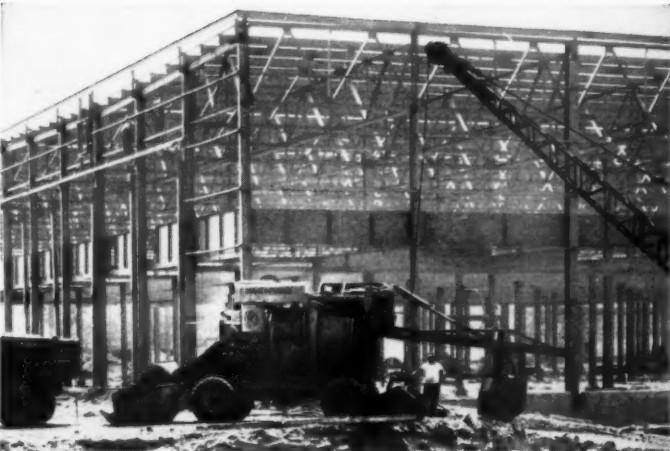
The No. 688 uses the same turbocharged diesel engine employed in the DW20 and DW21 tractors. In addition to the bulldozer and its cable or hydraulic controls, the new tractor can also handle a Hyster winch, a drawbar, and other attachments.

For further information write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 63.



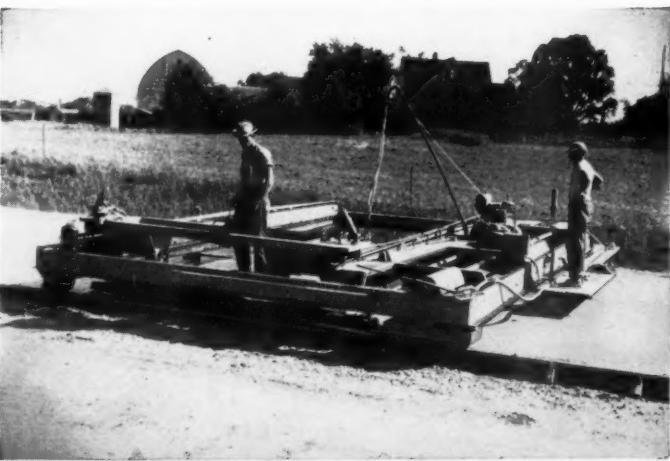
Big rubber-tires are easy on the sub-grade

Notice how there's little or no scuffing on the sub-grade with a Koehring rubber-tired 16-E paver. When working between forms, flotation of the big 11:00 x 20 pneumatic tires protects the grade against surface damage — saves unnecessary filling and re-leveling. This rubber-tired advantage also lets the Koehring 16-E twinbatch work on pavement without planking to pour adjoining slabs, widen highway and airport strips, pave intersections, pour concrete for curbs, gutters, culverts.



Mobile 16-E paver serves as a concrete mix plant

On building construction, versatile Koehring 16-E twinbatch pours footings, floors, columns — is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge — locks and holds in any position. Controlled-discharge bucket dumps anywhere along the 25-foot boom, can be opened or closed at any time for gradual discharge. Water-level capacity of bucket is 24 cu. ft. That's more than ample capacity to hold the full 16 cu. ft. batch of concrete, plus 10% overload.



Precision finisher keeps up with any paver

"Timely", precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete—harsh, wet or dry. It overcomes slump difficulties on grades and elevated curves. Produces mechanically accurate concrete slab surface, 8 to 30 feet wide, with uniform crown transitions.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 230

APRIL, 1957

Union Wire Rope news

Joseph Gunther has joined the Union Wire Rope Corp., Kansas City, Mo., and will specialize in stress-relieved materials and their application. Gunther has had his own consulting firm and was formerly with the Midwest Research Institute.



A slab of Indiana limestone, being used to form the curtain wall of a Pennsylvania state office building, is lowered into place between steel grid framework. After slabs have been hung and coated with a cement mixture they are backed by 2-inch-thick blocks of Foamglas insulation.



Buffalo-Springfield 3-Wheel Roller on a widening and bituminous resurfacing job.

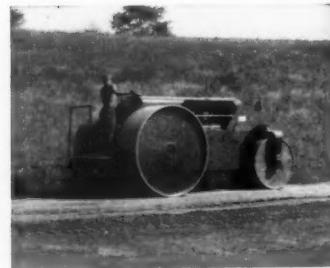
To compact largest variety of material, use Buffalo-Springfield's 3-Wheel Roller

Buffalo-Springfield Heavy-Duty 3-Wheel Rollers are long-time favorites for handling the wide variety of materials found in fills, subgrades and bituminous pavements. Variable weights in 10-14 and 12-15 ton sizes, power roll brakes, tapered roller bearings on all rolls... assure widest range of use, unequaled safety, maximum maneuverability, smoothest performance and longest operating life.

The Buffalo-Springfield 3-Wheeler's time-proven 4-speed transmission is an unmatched assembly

built for outstanding performance and durability under severe load conditions. Torque converter drive with 2-range transmission is also available as optional equipment.

When one roller must do many jobs, the Buffalo-Springfield 3-Wheel Roller is your best buy. Ask your nearest Buffalo-Springfield distributor today for all the reasons why Buffalo-Springfield 3-Wheel Rollers are top choice for multi-purpose compaction regardless of the type of material to be compacted.



This 3-Wheel Buffalo-Springfield Roller is compacting earth fill for new pavement.



Buffalo-Springfield 3-Wheel Rollers speed compaction on fill consisting primarily of slate refuse from a coal mine.



Here a Buffalo-Springfield 3-Wheel Roller compacts crushed stone base for new highway.

Write today for a copy of the new 3-Wheel Roller Bulletin, S-72-156.

Compaction equipment line

■ A bulletin covering its entire line of road rollers and compaction equipment is available from the Buffalo-Springfield Roller Co., a division of the Koehring Co. Condensed specifications on every B-S roller and piece of compaction equipment are included.

Construction and performance features are outlined for the KT-7 portable tandem, a conventional heavy-duty 3 to 5-ton two-axle roller. Standard and heavy-duty two-axle tandems are also described, as is the Gardner segmented roll—a roll faced with staggered rows of heavy steel pads that form compacting surfaces—which is available optionally for B-S two and three-axle tandem machines.

Construction features and on-the-job photos show how and why the K-45 Kompactor is setting new time and low-cost compaction records, the company reports. The section on three-axle tandem rollers with Walking Beam compaction control features a step-by-step diagram showing how this 13 to 20-ton roller delivers extra compactive effort to high spots only, making it especially effective during the initial leveling period.

To obtain Form No. S 74-157 write to the Buffalo-Springfield Roller Co., 1210 Kenton St., Springfield 99, Ohio, or use the Request Card at page 18. Circle No. 99.

Waterproofing membrane

■ A brochure describing Glasfab waterproofing membrane is available from the Twinsburg-Miller Corp. Glasfab is a woven-glass membrane reinforcement for waterproofing compounds.

The literature explains the purpose of a reinforcing membrane in below-grade waterproofing work and gives case histories of field applications. It also contains detailed specifications on both the hot and cold-process methods of application.

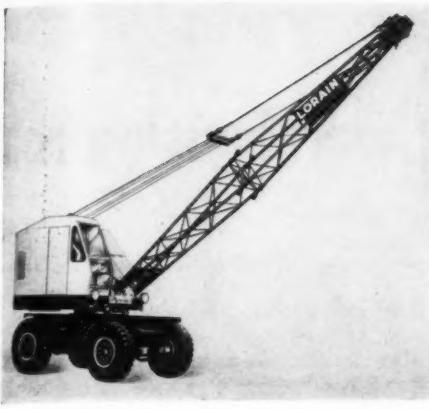
To obtain this literature write to the Twinsburg-Miller Corp., P. O. Box 207, Twinsburg, Ohio, or use the Request Card at page 18. Circle No. 104.

CONTRACTORS AND ENGINEERS



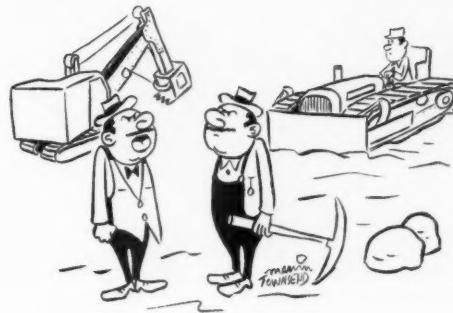
BUFFALO-SPRINGFIELD ROLLER CO.
DIVISION OF KOEHRING COMPANY • SPRINGFIELD, OHIO

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The Lorain Sp-107 requires no outriggers to develop full-rated 7-ton lifting capacities in all positions of turntable swing.

"Get to work, you stupid looking fathead!"



Self-propelled 7-ton rig works without outriggers

Cut Road Building Costs with SOIL AND BASE MATERIAL TESTS... on the CARVER LABORATORY PRESS

A new self-propelled construction rig, fully convertible to shovel, crane, clamshell, dragline, and backhoe, is able to develop full-rated 7-ton lifting capacities in all positions of turntable swing without outriggers, according to the Thew Shovel Co. The Lorain Sp-107 is mounted on a short-coupled 96-inch-square rubber-tire carrier with standard four-wheel drive. Hydraulic power steering of one axle is also standard, with four-wheel power steering optional.

The power takeoff on the turntable is through an automatic transmission and torque converter. This, coupled with the single-speed transfer case on the carrier, provides three travel speeds in both directions up to 15 mph. For digging operations where additional tractive effort and off-the-highway travel is needed, a modification of the transfer case permits the addition of three additional speeds in the lower ranges.

The independent travel provides for traveling, hoisting, swinging, and boom derrick simultaneously, with each under separate clutch control. The hydraulic system provides easy-acting control of the seven identical hydraulic clutches that actuate all turntable and carrier functions.

For further information write to the Thew Shovel Co., 28th & Fulton Road, Lorain, Ohio, or use the Request Card that is bound in at page 18. Circle No. 72.

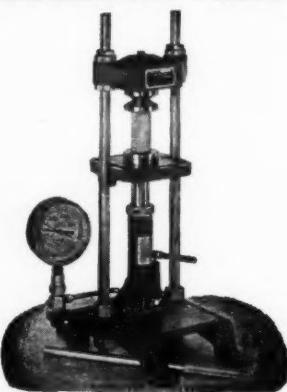
Motor scraper detailed

Design, engineering, construction, and operating features of the Allis-Chalmers TS-360 20-cubic-yard motor scraper are detailed in a bulletin from the company.

Among the features of the rig that are detailed are the tractor's 280-hp diesel engine, its heavy all-welded box-type frame, power train, selective hydraulic steering, controls, and the scraper's operational characteristics.

Specifications for both the TW-360 motor wagon and the TS-360 scraper are given. Both units can be pulled by the same two-wheel tractor.

To obtain Catalog MS-1104 write to the Allis-Chalmers Mfg. Co., Construction Machinery Division, 951 S. 70th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 105.



Numerous soil tests necessary prior to road building or other construction can be quickly and easily accomplished on the portable, hand-operated, self-contained CARVER LABORATORY PRESS. Moisture content, compaction, shear and other soil or base material characteristics are readily determined with this on-the-spot equipment.

Samples are quickly pressed for soil tests or further analysis and testing with Carver Test Cylinders, available in two sizes—1½" and 2½" diameter. Other Standard Accessories available include Carver Swivel Bearing Plates for comparative crushing tests of 2" 2" cubes; 2" x 4" cylinders and like requirements.

Several state road departments have used this equipment successfully for years. A Florida State Road Dept. engineer reports "Six Carver Presses are used daily for the numerous soil tests—." They have recently purchased four additional presses. The Texas State Highway Dept. has purchased over 30 Carver Laboratory Presses for such use—perhaps this thoroughly standardized Press will answer your pressing problems.

- CRUSHING TESTS • BRIQUETTING
- BREAKING TESTS • SHEAR TESTS
- BENDING TESTS

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
7 CHATHAM ROAD, SUMMIT, N. J.
Send catalog, describing Carver Laboratory Press and Standard Accessories.

NAME _____
FIRM _____
ADDRESS _____ 16

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APRIL, 1957



as the job moves...



SO MOVES THE PLANT!



Move it today—operate it tomorrow! And a batch plant too! Standard's revolutionary new portable batch type asphalt plant has been developed so that contractors can handle hard-to-reach paving jobs profitably. Consider what this remarkable unit can do:

1. Dismantle and move one day, re-erect and operate the next.
2. Provides full portability yet handles 60 tons per hour.
3. Gives maximum portability without loss of ruggedness.
4. Saves money through quick set-up and one man operation.
5. Saves time getting on and off the job; entire unit including hot and cold elevator can be set up in just a few hours.



Standard's portable asphalt plants provide the same experienced engineering and dependability as are found in Standard's large semi-portable Model RB asphalt plants. Both are backed by 53 years of development, knowledge and experience.

Write for catalog.

STANDARD
ASPHALT PLANTS

STANDARD STEEL CORPORATION

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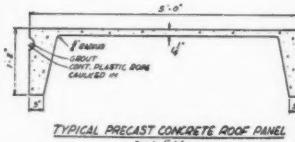


Acres of warehousing roof with

The concrete mix—consisting of portland cement concrete and a high grade of expanded shale aggregate—is chuted to a steel roof form.

One of the biggest jobs involved in constructing two huge warehouses at McClellan Air Force Base near Sacramento, Calif., is that of precasting 9,200 thin-shell roof panels for 35 acres of warehousing.

This is not only a big job, it is also a precise job. The 33-foot 4-inch x 5-foot panels, made of portland cement and a high grade of expanded shale aggregate, which is thoroughly mixed and vibrated only lightly, are being cast 60 at a time under rigid specifications. Every 250th panel is tested for deflection and recovery of deflection, and a tolerance of only $\frac{1}{4}$ inch is permitted in the over-all dimensions of each. While the panels measure 14 inches in depth at the rib, they hollow on the underside to form a shell measuring only $1\frac{1}{4}$ inch at the center.



A cross section of a precast roof panel shows the 14-inch depth at the rib and the $1\frac{1}{4}$ -inch shell at the center. These panels are being produced under rigid specifications set up by the Air Force.

These panels will roof the two single-story warehouses that sprawl over 1.5 million square feet in the western portion of the base—an area large enough to enclose a small farm or 23 football fields. Identical in design, one warehouse measures $400 \times 1,800$ feet, the other, $400 \times 2,000$ feet; both are divided into 200×400 -foot bays. A railroad spur runs through the site to separate the two structures, which have floors 3 feet 9 inches above track height.

When the entire warehousing facility is completed in 1958, it will serve as a super mail-order house and wholesale supplier for Air Force installations in California, Oregon, Nevada, and overseas. As the Air Materiel Command's largest West Coast installation for aircraft overhaul and repair, it will relieve the overcrowded warehouses at McClellan, the home of the Sacramento Air Materiel area. Aircraft accessories and components, and some missile and radar parts, will be among the 300,000 separate items worth \$662 million, stocked in the area.

Another Felker First!

FELKER
di-lock

**A GREATLY IMPROVED
DIAMOND BLADE cutting 26%**

to 70%

more footage in concrete!

Now you can get greatly increased footage on concrete cutting jobs by specifying new Felker DI-LOCK Segmented Diamond Blades! Resulting from a totally new base alloy and manufacturing technique, here is a vastly improved blade having a solid, dense metallic bond that literally coats every diamond particle with a new alloy! Each diamond is securely gripped and held until life is completely exhausted! No microscopic voids; no gas pockets; no coarse, granular rim metal to weaken the grip on costly diamonds . . . no fractured diamond particles to reduce cutting speed or tear loose from the segments under high impact!

Proved on competitive tests to be the most outstanding development in diamond blades for concrete, with footage increases from 26% to 70% over other standard blades tested on the same job! Get the facts on Felker DI-LOCK today! Available from all Felker Distributors.

Remember, Felker means Footage!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 233



**FELKER
MANUFACTURING CO.**

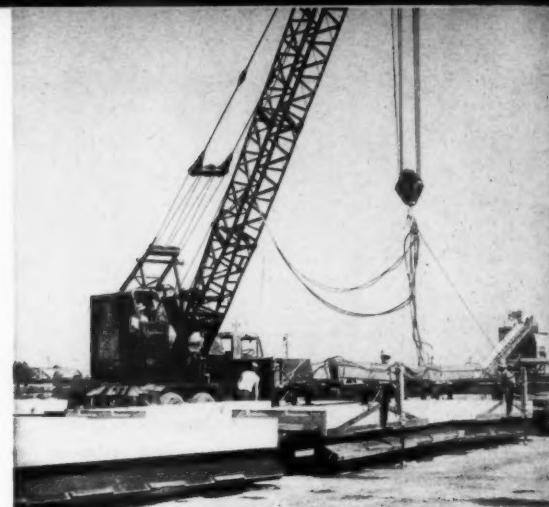
Torrance, California

First in Diamond Cut-Off Blades!

roof with thin-shell, precast panels

Air Force's 35-acre facility requires more than 9,000 panels; contractor forms 60 of the 33.3 X 5-foot panels simultaneously

After 48 hours, the thin-shell roof panels are removed from their forms and given a light spray of Hunt Process Clear. The modified truck-crane strips a panel within three minutes.



Construction of the facilities—warehouses, rail spur, roads, and utilities—is being done under a joint-venture contract by four Sacramento firms, the Heller, Campbell, Erickson, and Lawrence Construction Co.'s. These firms worked a 10-hour day through last season, and to date the job is more than 65 per cent complete. Working at the same pace, the firms expect to complete the 1,800-foot warehouse by October and the 2,000-foot warehouse in January.

Footing excavation

A total of 38,500 yards of unsuitable sandy silt and sandy clay making up the surface soil in this area was excavated by the H. Earl Parker Co., Marysville, Calif. This firm also placed the 81,000 cubic yards of select aggregate fill for the subgrade. This material supplied by Pacific Coast Aggregate Co., Fair Oaks, Calif., was compacted to a 98 per cent density by a compactor and 3-wheel roller because of the unusually heavy loads per square foot that will be imposed on the warehouse floor.

The column footings, with bearing capacities of 4,000 pounds per square foot for live loads plus dead load, and 3,000 pounds per square foot for dead load only, were used for all footings founded on hardpan. The footings, of Class B concrete, range in size from 4 feet square to 12 feet 6 inches square. Excluding those at the firewalls, which are mushroom-type caisson footings, reinforced-concrete spread footings were used. Concrete for this work was batched by a Noble plant at the site, and the 5-yard batches were brought to the warehouse area in 6-yard trucks.

As soon as the column footings had been constructed and the area around them backfilled, the ground to be used for the casting surface was smoothed and compacted and the foundation wall panels cast. As these were erected, the foundation wall pedestals were poured up to the soffit of the floor.

Arrest floor-slab checking

The 8-inch-thick, unreinforced concrete floor slabs were poured by Carsons & Peters Co., Los Angeles, in 25-foot wide lanes that had inserts left for temporary wall braces. More than 40,000 yards of Class AA concrete, meeting a minimum compressive strength of 3,750 psi at 28 days,

(Continued on next page)

For more facts, circle No. 234→



**245 hours less greasing time...
245 hours more profit time **EVERY YEAR!****

Time saved by 1,000-hour lubrication intervals on your Allis-Chalmers tractor adds up to 245 hours every year—an extra month of production!

On truck wheels, support rollers and idlers, an exclusive combination of positive, spring-loaded seals and tapered roller bearings keeps out dirt and moisture, prevents loss of lubricant.

For 1,000 tractor work hours, you can forget about every grease point below track level. When it's time for servicing, simple low-pressure flush lubrication replaces old grease completely, eliminates seal popping, prevents damage to seal faces. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

IT'S SIMPLE ARITHMETIC!

	Other Tractors	Allis-Chalmers Tractors
No. of greasings per year (5,000 hr)	up to 500	5
Greasing time (av. conditions)	1/2 hr	1 hr
Time spent greasing	up to 250 hr	5 hr
PRODUCTION TIME GAINED ...		245 HOURS EVERY YEAR!

ALLIS-CHALMERS

Engineering in Action



Work on the continuous reinforced-concrete framing keeps up with work on the floor slabs for the 1.5 million-square-foot warehouse facility. Extra reinforcing in girders and columns give the structures added strength.

was supplied by the prime contracting firms.

As the concrete was placed and vibrated, it was screeded by a roller screed that was powered by a gas engine. It made only one pass and left no coarse aggregate visible. The slabs were then hand-troweled.

Much of the concrete for the floor slabs was placed when temperatures at McClellan ranged from 85 to 110 degrees F., and during these hot days, some of the slabs started to cure improperly and surface cracks began to appear. Strangely enough, it was found that the defective slabs were those poured during the cooler morning hours.

This was attributed to the aggre-

gate cooling off during the night, then warming up again under the morning sun as the concrete started to set. Aggregate used in concrete placed during the afternoon had already warmed up enough so that surface checking did not occur. This trouble was eliminated when the contractor started fog-spraying the slabs immediately after the surface had been troweled.

Soon after the first floor slab had been approved, the exterior wall segments and firewall segments were cast on the floor slab. Erection of the cast-in-place, continuous reinforced-concrete framing began at the same time.

The exterior wall columns resting on the largest footings are 20×24 inches at the bottom and increase to 20×42 inches at the top. The cast-in-place girders are continuous, running the width of the building, except for an expansion joint near the middle. These girders, spanning 67 feet, are reinforced at top and bottom for their full length and have web reinforcing throughout. Though the curing period for the girders was 21 days, shoring was left in place 28 days. The framing was poured by cranes and 1-yard buckets that were supplied with concrete by transit-mixers. On this part of the construction job, the $\frac{3}{4}$ -inch plastic-coated plywood used in the forms was supplied by Georgia Pacific Plywood, San Francisco, Calif.

Tilt-up walls

The precast, reinforced concrete tilt-up walls are of different sizes. Exterior and shear walls are 6 inches thick, while firewalls are 8 inches thick. The heaviest of all are the firewalls, which abut the shear walls throughout the building at the end of each 200-foot bay. The largest of these panels measure 27 feet long and 24 feet high and weigh 27 tons. Columns tie the panels together, giving the wall a six-hour fire rating.

As soon as the panels have been hoisted into place by two 30-ton cranes, steel from adjacent panels is looped together and welded at the top, middle, and bottom of the panels. This reinforcing steel is being supplied by the F. A. Klinger Co., Stockton, Calif.

The contractor had a choice of either precasting or casting in place the 800 roof beams for the warehouses. Choosing the former method, it being the least expensive, the contractor set up nine specially designed roof beam forms. This allows nine beams to be formed daily, since forms are stripped in 18 hours.

During hot weather, the beams had to be covered with wet burlap and given an automatic fog spray to keep the concrete damp enough to cure without cracking and checking.

Precasting roof panels

The 33-foot 4-inch×5-foot roof panels, measuring 14 inches deep at the rib and 1½-inch at the center, are being cast in rigid steel molds that are coated with a mineral oil



The new Wooldridge "Cobrashau" Rear Dump Unit with Fuller 9-speed R-1150 ROADRANGER Transmission.

FULLER R-1150 ROADRANGER® Transmission standard on new Wooldridge "Cobras"!

The Fuller 9-speed R-1150 ROADRANGER Transmission is standard equipment in the new Wooldridge 35-ton, 275 hp diesel "Cobrashau" Dumper and 26-yard 300 hp diesel "Cobra Quad" Scraper. Haul speeds exceed 32 miles an hour on the big 63,400 lb. unit.

Throughout the complete Wooldridge line... from the giant 41-yard scrapers down to and including the 7.5-to-10-yard "Cobrette," Fuller Transmissions are standard on Wooldridge Scrapers and hauling units.

Why? Only the most rugged, dependable transmissions can take the terrific shock loads—sudden starts—

stops—torque reversals found in all kinds of off-highway operations from solid rock hauling to soggy swamps jobs.

Fuller Transmissions provide maximum ease of shifting ratios for faster acceleration and long life required for these operating conditions.

In Wooldridge's "Cobrashau" and "Cobra Quad," the Fuller R-1150 ROADRANGER Transmission offers these additional advantages:

- No gear splitting—9 selective gear ratios evenly and progressively spaced
- Easier, quicker shifts—38% steps between ratios

really
where horsepower goes to work



- One shift lever controls 9 forward and 1 reverse speeds
- Engines work in peak hp range with greater fuel economy
- Less driver fatigue—½ less shifting
- Range shifts pre-selected—automatic and synchronized

From over 110 models available for rubber-tired equipment, there's a Fuller Transmission designed to do your job.



FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 7, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
For more facts, use Reader-Reply Card opposite page 18 and circle No. 235

bond-breaking agent before the light mesh reinforcing is placed. As concrete is placed in the forms, a free-piston air vibrator is used along the top of the panels. The vibrator serves mainly as a screed, vibrating only the top of the mix.

Panels are left in the forms 48 hours, then they are stripped and a light Hunt Process Clear curing spray applied. The panels are later stacked near the casting yard for a 60-day cure. A modified lumber carrier picks up the panels and transports them from the casting yard to the work site.

Two inches of perlite concrete is being applied for roof insulation. Roofing felt and a 5-ply asphalt will be used over the entire surface to form a built-up roof for each warehouse. A hundred pounds of asphalt and 500 pounds of embedded gravel per 100 square feet of roof will be applied in two layers. This work will be done by a subcontractor, Sacramento Roofing Co., Sacramento.

The new warehouse is based on a standard design used at other Air Force bases, but some changes have been made in the McClellan warehousing so that the roof failures in some of the existing warehouses will not be duplicated in the new facility. Both girders and columns have been strengthened.

Additional reinforcing has gone into the critical areas in the tops of girders, and though the number of steel bars in the bottom of the girders has remained constant, they have been increased in size. This gives the girders 40 per cent more strength than the girders in the existing structures. Additional reinforcing bars—and bars of increased size—are also being used in the columns.

Personnel

The original design for the warehouse, made by L. P. Kooken Co., Baltimore, Md., was modified and adapted to the site by Tudor Engineering Co., San Francisco. Criteria for the facility were developed by U.S. Air Force Installations Engineers. Responsible for monitoring the work is the office of the Air Force Installations Representative, South Pacific Region, which is headed by Col. Edwin M. Eads. Lt. Col. Jack B. Marshall, installations engineer for McClellan, is performing base supervision for the Air Force. Design and construction contract responsibility is that of the South Pacific Division, U. S. Army Corps of Engineers, which is headed by Brig. Gen. William F. Cassidy. The contract for the project was let through the Sacramento District of the Corps, which is headed by Col. A. E. McCollam. THE END

Colorado Fuel & Iron news

Production facilities for the manufacture of Cal-Tie wire have started at the Pueblo, Colo., plant of the Colorado Fuel & Iron Corp., New York, N. Y.

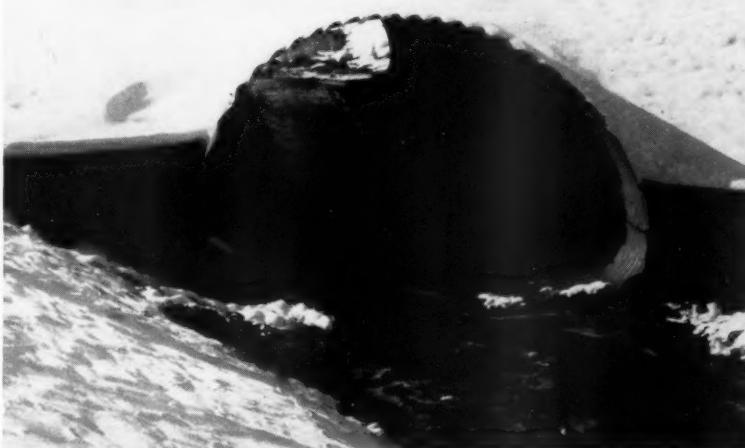
Cal-Tie wire is a special steel wire product for tying reinforcing bars.

For more facts, circle No. 236→

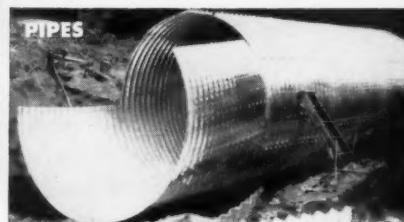
The floor of the warehouse is laid in 25-foot strips. Concrete is delivered directly to the site by transit-mix truck. A roller screed powered by a gas engine makes one pass to bring concrete to grade; hand finishing follows.



Eliminate Drainage Problems—Permanently—with AMBRIDGE SECTIONAL PLATE



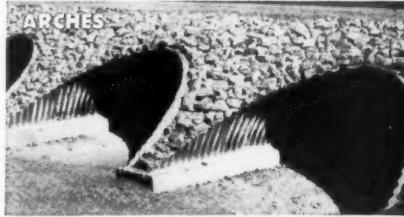
AmBridge Sectional Plate Pipe-Arch carries two-lane roadway of State Route 89 over stream about six miles east of Ashland, Ohio. Sectional plate supplied by United Steel Fabricators, Inc. and put in by Walter Jones, the contractor.



PIPES



PIPE-ARCS



ARCHES

NEW CATALOG NOW READY

Containing complete information on AmBridge Sectional Plate Pipe, Pipe-Arches, and Arches. Our new 28-page catalog covers design, sizes, weights, gages and assembly instructions. For free copy, just write our nearest office.



T-829

AMBRIDGE SECTIONAL PLATE

UNITED STATES STEEL

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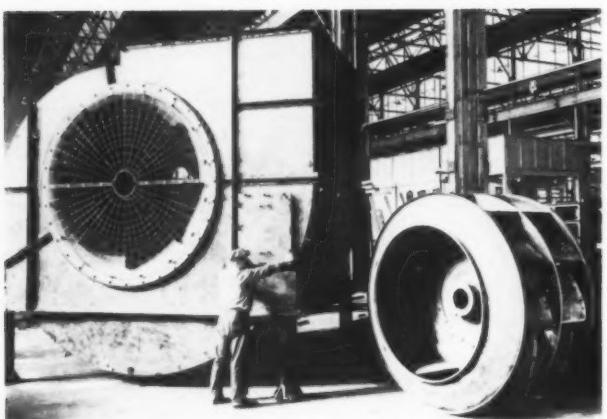
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APRIL



THE FIRST OF 32 HIGH-POWERED SUPPLY AND EXHAUST FANS for ventilating the Baltimore Harbor Tunnel stands at right, ready to be installed in the housing by the American Blower Division of American-Standard, Detroit, Mich. The ventilating system of the tunnel will have 12 fresh-air supply fans, 12 exhaust fans, and 8 standby units—4 for supply and 4 for exhaust. When the 24 fans are operating at full speed, more than 3 million cubic feet of fresh air per minute will be supplied to the tunnel, and the same amount will be removed as quickly.

G-800 TRACDRIL

GOES
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IT...

And starts drilling! Just one man can move a self-propelled CP Tracdril from hole-to-hole in double-quick time . . . requires no "bull work" . . . tows its own compressor. "Knee-action" tracks compensate for uneven ground. A hydraulically operated U-Arm assures quick positioning for running bench holes or lifters. Hard hitting 4" CP-400 Drill and CP Drill Carriage are combined to afford maximum drilling speed, feed and stability.



Chicago Pneumatic

8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS
DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS
VACUUM PUMPS • AVIATION ACCESSORIES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 237



Crawler tractor described

■ International Harvester has announced a brochure on the 200-hp Model TD-24, the largest of the IH line of seven crawler tractors. Entitled "Boss of the Big Jobs", the brochure emphasizes the solid framework of the tractor, its planet power steering, and the option of torque converter or gear drives.

Line drawings illustrate components of the torque-converter drive system, the main frame, and a cut-away exposure and explanation of the planet power steering system. Diagrams illustrate steering clutch positions when the operator desires the unit to make gradual, feathered, or pivot turns.

To obtain Folder CR-565-G write to the International Harvester Co., Construction Equipment Division, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 102.

Self-priming pump line

■ A folder covering operating characteristics and applications of its lightweight Porta-Pump line is available from the Barnes Mfg. Co. The literature describes the four models of the portable self-priming unit, which is available with gasoline, electric, or universal drive.

Complete specifications for all models, plus an easy-to-read pump performance chart, are shown. Model IMAE, with an electric close-coupled drive, discharges up to 1,440 gph. The complete unit weighs 28 pounds.

To obtain Form No. 327 write to the Barnes Mfg. Co., N. Main St., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 97.

Lycoming promotes two

Ralph E. Evans, former sales engineer, has been promoted to general sales and service manager for industrial engines manufactured by the Lycoming Division, Avco Mfg. Corp., Stratford, Conn. At the same time, the firm advanced Harry Cuthbert to installations engineer for industrial engines. Cuthbert was formerly power plant designer for guided missiles with the Douglas Aircraft Co.

Measuring tapes, rules

The complete line of measuring tapes and rules available from The Lufkin Rule Co. is described in detail in a 160-page catalog from the firm. Included are metal and fabric measuring tapes, engineers' tapes and oil-gaging tapes; and metal and wood folding rules, tap rules, and miscellaneous rules.

Sections explaining the features of the various types of measuring rules and tapes, describing the standards to which the products are manufactured, and listing the special gradations available on request are also included. There is an alphabetical index and an index by numerical stock numbers.

Each product is pictured and described. A brief listing of recommended uses is given. Illustrations of the actual tapes and rules, many of them full size, are shown.

To obtain Catalog No. 104, write to The Lufkin Rule Co., 1730 Hess St., Saginaw, Mich., or use the Request Card that is bound in at page 18. Circle No. 103.

Conversion Chart

A reference conversion chart for engineers, contractors, architects, and other persons in the construction field has been published by the Precision Equipment Co. The chart includes such common conversions as inches to centimeters and watts to horsepower. It also covers conversions that are often difficult to locate in reference manuals—atmosphere to kilograms per square centimeter, centimeters per second to mph, cubic feet to liters, microns to meters, and quintal to pounds.

To obtain this chart write to the Precision Equipment Co., 3716 N. Milwaukee Ave., Chicago 41, Ill., or use the Request Card at page 18. Circle No. 95.

Fuel injection system

The Cummins PT diesel fuel injection system is explained in a booklet from Cummins Engine Co., Inc. The booklet details the components of the system, describes the metering of the fuel, and explains how the system operates.

Cutaway views of the four PT fuel pump assemblies, as well as the PT injector, illustrate the inner workings of the system. A section of the booklet is devoted to optional governor arrangements.

To obtain this booklet write to Cummins Engine Co., Inc., Columbus, Ind., or use the Request Card at page 18. Circle No. 100.

Lincoln Electric news

The Lincoln Electric Co., Cleveland, Ohio, has added Barron J. Gue to the staff of its Pittsburgh, Pa., district office. Gue was previously in Lincoln's training program in Cleveland.

David M. Thorsen has joined Lincoln's Union, N. J., district office. He was formerly a member of the Cleveland district office.

"And you say this rough language your fellow construction workers use is very offensive to your sensitive nature?"



Teleramic ON THE JOB in Illinois

Chicago Construction Company Reports...

This Anthony Frameless Trailer Hauls One Extra Ton Per Load!

IT'S NO SECRET!
The Teleramic "V" Seal Hoist
Is A Major Factor In
Frameless Trailer Success



Proven "V" seal packing is only one of many quality features in the Teleramic Hoist design. Because the dry operating "V" seal is self-adjusting, repacking or manual adjustment of the Teleramic cylinder is very rarely needed. "Truse rings" encircle and reinforce the ends of each cylinder tube to prevent "flaring." Extra long bronze bearings and long overlap of the cylinders help keep them perfectly aligned.

During a 17-week test period of steady rock hauling; this Anthony Frameless Trailer proved itself better in performance and more profitable to operate than similar equipment used on the same jobs. This was the report from Consumers Company of Chicago, Illinois, which is currently using this Anthony Frameless Trailer on major paving jobs in the Chicago area. Here are the conclusions they reached after a careful study of the facts:

- ① Anthony Frameless Trailers (lighter than similar hauling equipment) carry at least 1 extra ton in each payload over standard equipment.
- ② In all other hauling and dumping operations, Frameless Trailers equal or exceed similar hauling equipment.
- ③ It is almost impossible to get bogged down with an Anthony Frameless Trailer. If the trailer is stuck, the driver sets his tractor brakes and raises the Teleramic Hoist. If the tractor is stuck, the driver sets his trailer brakes and lowers his Teleramic Hoist.

Buy The Dump Body That Has The Service

Over 100 Anthony Distributors are located nationwide. At least one is convenient to you... ready to give immediate service on all Anthony equipment.

Just write to: 1754 Baker Street

Complete descriptive literature is now available on Anthony Frameless Dump Trailers and Teleramic Hoists. No obligation, of course!

ANTHONY COMPANY • Streator, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 238



The new Seaman-Gunnison bituminous distributor features an improved circulation system and a Duo-Flo spray bar.

New circulation system employed in distributor

■ Bituminous distributors with a new principle of tank circulation and a new Duo-Flo spray bar are announced by the Seaman-Gunnison Corp. The units are available in truck or trailer-mounted models in capacities of from 800 to 4,000 gallons.

The new three-way circulation system provides complete tank circulation from end to end, for uniform heating of the material to required spraying temperature; parallel flow through the bar when spraying, for uniform pressure at every nozzle; and series flow through the bar when the nozzles are closed, to maintain tank

temperature at bar and nozzles.

In all cases, the material in the tank is continually circulated to prevent overheating adjacent to the heater flues. This is said to eliminate local hot spots, solvent evaporation, and nozzle-clogging deposits due to coking.

Both sections of the Duo-Flo spray bar receive material at tank temperature, thus maintaining material temperature and uniform pressure clear to the ends of the bar. Both lines from the tank feed the bar, creating a true parallel flow, the company reports. The diameter of each bar pipe has been reduced, resulting in less material to flush.

For further information write to the Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee 15, Wis., or use the Request Card at page 18. Circle No. 69.

Self-propelled carriers

■ A manual covering its line of self-propelled carriers for transit mixers and shovel-cranes is available from the Crane Carrier Corp. Complete specifications, a line drawing showing all pertinent dimensions, and descriptions of the key features for each model in the line are shown.

The manual covers the Mixer-Master Model M-625-C and the Mixer-Carrier Model M-450 for transit mixers. It also covers the Model 1066-A, 6x6 all-wheel-drive carrier for $\frac{1}{2}$ -cubic-yard 10-ton cranes; the Model 1266-A, 6x6 all-wheel-drive carrier for $\frac{1}{2}$ -cubic-yard 12-ton cranes; the Model 1364-A, 6x4 carrier for $\frac{1}{2}$ -cubic-yard 12 $\frac{1}{2}$ -ton cranes; the Model 1564-A, 6x4 carrier for $\frac{1}{2}$ -cubic-yard 15 to 17 $\frac{1}{2}$ -ton cranes; the Model 2064-A, 6x4 carrier for 20-ton cranes; the Model 2564-A, 6x4 carrier for 25-ton cranes; and the Model 3064-A, 6x4 carrier for 30-ton cranes.

To obtain this manual write to the Crane Carrier Corp., P. O. Box 5008, Tulsa, Okla., or use the Request Card at page 18. Circle No. 101.

Speed-reduction drives

■ A new catalog describing its recently introduced line of shaft-mounted Screw-King speed reducers designed for screw conveyor application is available from The American Pulley Co. By following the directions outlined in the catalog and using the tables a complete drive can be designed in minutes, the company reports.

Screw-King speed reducers are available in three reduction ratios—5 to 1, 13 to 1, and 20 to 1—for screw conveyors requiring up to 10 horsepower and speeds of from 15 to 290 rpm.

To obtain Catalog SCD-57 write to The American Pulley Co., 4201 Wissahickon Ave., Philadelphia 29, Pa., or use the Request Card at page 18. Circle No. 98.

**ALL
WELD**

and a

**YARD
WIDE**

... That's YAUN'S 2 $\frac{1}{2}$ YD. BUCKET



ALL Yaun products are ALL-WELDED, for more strength, with less dead weight. Typical of Yaun's complete bucket line is the 2 $\frac{1}{2}$ yard clamshell shown. Weld #1, 3 yards long, is Manganese hard surfacing, to keep the cutting lip smooth and sharp for bite after bite, job after job, year after year. All Yaun buckets, drag or clam, have Manganese steel wherever they hit the load; they dig and dump fast and clean, and have long useful life.

Sold by equipment distributors world-wide.



YAUN MAKES DRAGLINE BUCKETS

Shell
Basket
Perforated

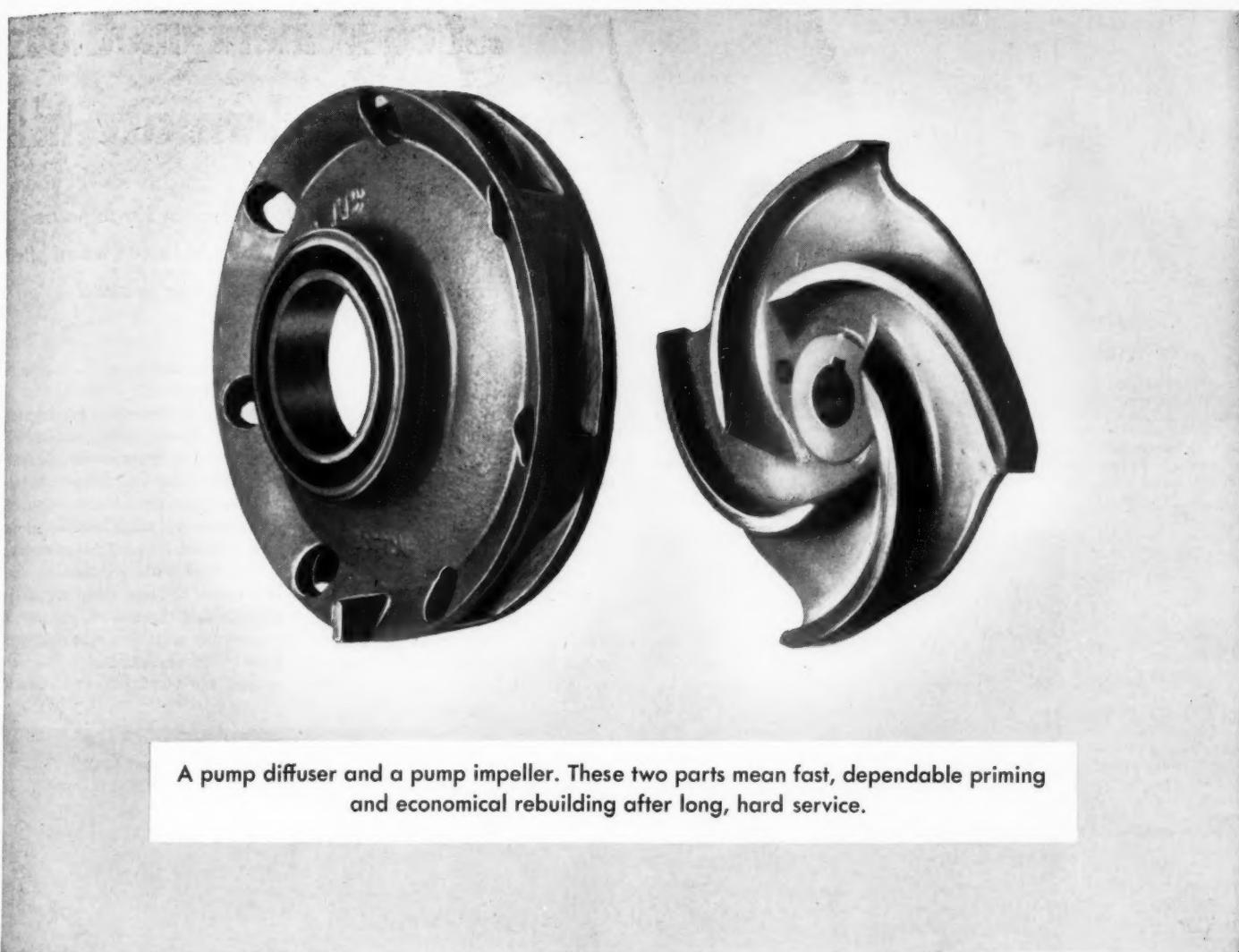
**CLAMSHELL BUCKETS
CONCRETE BUCKETS
IN ALL SIZES**

BATON ROUGE, LOUISIANA

YAUN

MANUFACTURING CO.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 239



A pump diffuser and a pump impeller. These two parts mean fast, dependable priming and economical rebuilding after long, hard service.

Replacing Two Simple Parts Restores Pump's Full Efficiency Modern "Diffuser" Pumps Rebuilt Easily, Rapidly, Inexpensively

Metal parts in any pump will wear after hard service, particularly when handling suspended sand or abrasive solids. Therefore, economical rebuilding is essential. In diffuser-primed pumps, rebuilding is accomplished by replacing two simple parts — the diffuser and the

impeller. It is not necessary to replace the expensive pump casing. Full factory efficiency is restored with the replacement of these parts. Replacement of the diffuser and impeller is easy and the parts are inexpensive and readily available.

Diffuser-primed pumps are the only contractor's pumps which offer this cost-saving advantage and also provide the other two essential requirements of self-priming pumps: quick priming action and clog resistance.

Quick priming is obtained in Marlow Contractor's Pumps because the diffuser provides a multiplicity of priming points. Each vane in the diffuser performs this function. With at least six vanes in the Marlow pump, it tends to separate air faster, thus priming more rapidly.

When a Marlow is primed, water is discharged through all diffuser ports around a full circle. Dirt and debris cannot accumulate because its 360° cleaning action clears clogging accumulations at the base of the pump casing. There are no dead segments to hold muck and silt which reduce pumping efficiency.

Diffuser-primed pumps are fast priming, resistant to clogging and economical to rebuild . . . and only a Marlow pump is diffuser primed. Ask your dealer to show you Marlow's Contractor's Pumps and the two inexpensive replacement parts. They mean better pumping and greater economy to you.



This is "diffuser priming." Note the 360° cleaning action and the "multiple point priming."

For more facts, use Reader-Reply Card opposite page 18 and circle No. 240



6-130A

DIVISION OF
BELL & GOSSETT CO.
Midland Park, N. J.

Morton Grove, Illinois

Longview, Texas



Rising 11 stories to dominate the street is the main section of the City Hall. The steel frame has been completed, and other work is well along. An Archer tower, with a Chicago boom, carries materials to upper floors.

This Koehring 34-E Twinbatch paver, its boom and bucket removed, mixes concrete for the walls and larger pours. The paver, which is moved around the site, is supplied with water from the municipal supply by a long hose.



The concrete, made with Haydite lightweight aggregate to reduce the dead weight of the structure, is discharged from the paver to a 1/3-yard-capacity Bell Prime Mover that will be hoisted to the proper floor in the tower.

On some pours like this, the Bell Prime Mover remains on the floor of the building. Concrete hoisted to the floor in a 1-yard tower bucket is dumped to a hopper to be transferred to the buggy.



Newest equipment, methods complete modern city hall

Paver mixes concrete at site for large pours on 11-story structure; foundation of wood piles drilled 75 feet to point bearing in sand

Dominating the group of buildings that will make up the new Civic Center for New Orleans, La., is the City Hall, an 11-story, \$7 million structure that will be formally dedicated this month.

Still under construction in the center are three other buildings—a Louisiana Supreme Court Building, a Louisiana State Office Building, and a City Library. A Civil Courts Building is proposed for future construction. Plans for the center were prepared by two groups of New Orleans architects, Goldstein, Parham & La-

bouisse, and Favrot, Reed, Mathes & Bergman.

These architects also supervised the City Hall construction, which was handled by R. P. Farnsworth & Co., Inc., New Orleans. In addition to this building's tall 320×76-foot 11-story unit, there are three smaller wings. One of them is a 127×14-foot wing with curved walls and sloping floor that houses the beautiful theater-like City Council Chambers. A covered driveway is included in this wing. A 200×120-foot garage that will accommodate 386 cars on three levels and



Plastering for fireproofing and for the interior finish was one of the mechanized operations on the City Hall. Plaster mixed in this Anchor plaster mixer is being dumped into a mud box and will be loaded to wheelbarrows by hand and brought to a plastering machine.



Plaster forced through a hose by an E-Z On plastering machine is applied from the nozzle handled by the workman. Another man, standing on the Ezibilt rolling scaffold, trues up the surfaces with a straightedge as the plaster is applied.

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The former slum area cleared for construction of the new Civic Center in New Orleans, a Koehring 601 dragline with a $\frac{3}{4}$ -yard Hendrix bucket loads earth to a Ford dump truck as excavation starts for the City Hall. An American 375 dragline works in the background.

on the roof makes up another wing.

The center's five-block site, formerly a slum area, is located at the edge of the New Orleans loop and is bounded by Poydras, Loyola, Gravier and LaSalle streets. The New Orleans City Government began acquiring the tract in 1946, when low-value residential and commercial buildings still occupied the area. As the city gained title to the property, the old buildings were removed or razed to clear the site preparatory to the start of construction operations.

Drill and drive piles

Providing adequate foundation support for a large building is always a problem in this Mississippi River delta area, and this job proved no exception to the rule. Since the mucky alluvial soil is very high in organic content and does not provide dependable resistance for friction bearing piles, piling had to be driven to point bearing in one of the underlying layers of sand.

The first two layers of sand encountered were too thin to provide enough bearing without the danger of the piles going through, and the piling had to penetrate through these to a third sand strata some 75 feet below street grade. While the first sand layers did not offer suitable bearing, they provided enough friction to cause damage to piling driven to reach the third strata.

This type of foundation problem was not new to the architect's organization which, with Farnsworth, came up with a plan and some special equipment to handle the job satisfactorily. Using a shop-made fishtail bit handled by a Koehring 304 crane and powered from the crane engine through a reduction gear box, the contractor drilled 14-inch holes from the basement elevation down through the first two sand layers to a depth of about 50 feet.

As the drill bit was withdrawn, the 63-foot untreated timber piles were inserted in the holes and driven to final bearing. A Koehring 605 crane with 65-foot swinging leads and a Vulcan No. 1 steam hammer handled this driving operation. Most of these piles developed their bearing with the points about 75 feet below street grade. Mail chain saws cut the butts to the predetermined cutoff grade.

Each group of 12 to 23 piles in the main footings was capped with a heavy concrete footing that supports the base plates for the structural steel frame of the building. The basement

(Continued on next page)



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The only calculator that brings Automation to Estimating

for HIGHWAY DEPARTMENTS, CONTRACTORS and ENGINEERS

A desk calculator with automation, this *new* Monroe-Matic speeds up road work figuring and eases the load on time-limit estimating. The exclusive ability to compute length \times width \times depth in one continuous operation—without keyboard resetting—has put this calculator on hundreds of job sites all over the country. Determining curve radii; computing grade line elevations; traverse problems in coordinates, latitudes and departures, cuts and fills—here is double assurance of accuracy on any engineering or construction problem. This versatile machine also saves real time on payroll, cost control, inventories, many other calculating problems.

It is a veritable figure-work bulldozer.

Monroe Calculating Machine Company, Inc.

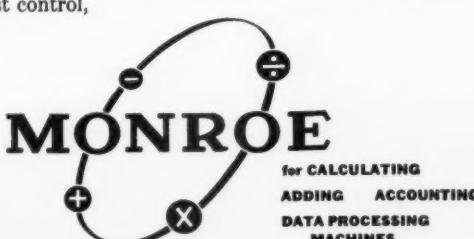
General offices:

Orange, N. J.

Offices throughout

the world. Locate the nearest Man from Monroe in the yellow pages of your telephone directory.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 241



(Continued from preceding page)

area was then floored with an 8-inch reinforced-concrete slab that was made waterproof. A fill of 15 inches of gravel was placed over this slab, and the 6-inch concrete slab for the finished basement floor was placed on the gravel bed.

Paver supplied concrete

The 12-inch basement walls were formed with plywood and poured by a Koehring 605 crane with a Gar-Bro 1-yard laydown bucket. Concrete for these walls as well as most of the other major pours was mixed on the site by a Koehring 34-E Twinbatch paver.

A Blaw-Knox batching plant was set up on a railroad siding just about two blocks from the building site. Aggregates received by rail were transferred to the 3-compartment bin by a Koehring 304 crane with a Blaw-Knox $\frac{3}{4}$ -yard clamshell bucket. Cement, also delivered to the plant by rail, was stored and batched through a Blaw-Knox Hi-Lo cement plant with a 400-barrel low bin and a 200-barrel high bin. Ford trucks carried the 37.4-foot batches from the plant to the paver.

Most of the concrete for the basement of the main building and the low wings was placed by Koehring 605 and 401 cranes with Gar-Bro buckets. The boom and bucket were removed from the Koehring paver, but it was kept completely mobile so that it could be moved into the most convenient position for bucketing concrete directly to the forms for each pour. Working from any position on the site, the paver had its water tank connected with the municipal supply by a long hose.

When the structural steel frame of the 11-story unit of the building had been erected, an Archer twin tower was set up to bring the concrete and other materials to the various floors. When concrete was being hoisted in the tower, the mixer was positioned so that the mix could be discharged directly into the tower bucket.

On the larger pours, the concrete was hoisted by the 1-yard tower bucket to a $1\frac{1}{4}$ -yard hopper. Three Bell Prime Mover power buggies, with a capacity of $\frac{1}{2}$ yard each, transported the concrete from the hopper to the point of placement. One of these pours of more than 200 cubic yards of concrete was completed in seven hours with this combination of paver, tower, and power buggies.

A Rex 16-S mixer provided the concrete on some of the smaller pours. In some cases it was more convenient to hoist the Bell Prime Mover buggies on the platform hoist of the tower than to move the hopper from floor to floor for small amounts of concrete.

All of the concrete above grade in the 11-story unit of the building was made with Haydite lightweight aggregate to reduce the dead weight. Concrete was consolidated in the forms by Mali and Dreyer vibrators, and finished concrete floors were troweled by Whiteman power trowels.

The three-story garage section was

built entirely of reinforced concrete. Round columns were formed with 18 and 22-inch Sonotubes. The floor was poured on J. & B. pans furnished and installed by the J. & B. Mfg. Co., Houston, Texas.

Structural steel frame

The structural steel frame of the main building was furnished and erected by Jones & Laughlin Steel Co. A crane working from mats on the first floor level set all of the high steel with its 125-foot boom and 20-foot jib.

Some of the structural steel was encased in concrete, but most of it was fireproofed with a 1½-inch coating of vermiculite plaster, which was applied over the metal lath covering the columns and floor beams.

Floors in the structural steel section were decked with Robertson Q-flooring and a fill of 2½ inches of concrete placed over the metal decking. The decking work was sublet to Orleans Material & Equipment Co., New Orleans, and the actual installation was done by Sun Erection Co., New Orleans. Lincoln 180-amp welding generators provided the current for welding the decking in place.

Plaster applied by machine

The subcontractor on the plastering, F. M. Gravier, Atlanta, Ga., used a mechanized method for applying much of the plaster used for fireproofing and interior finish.

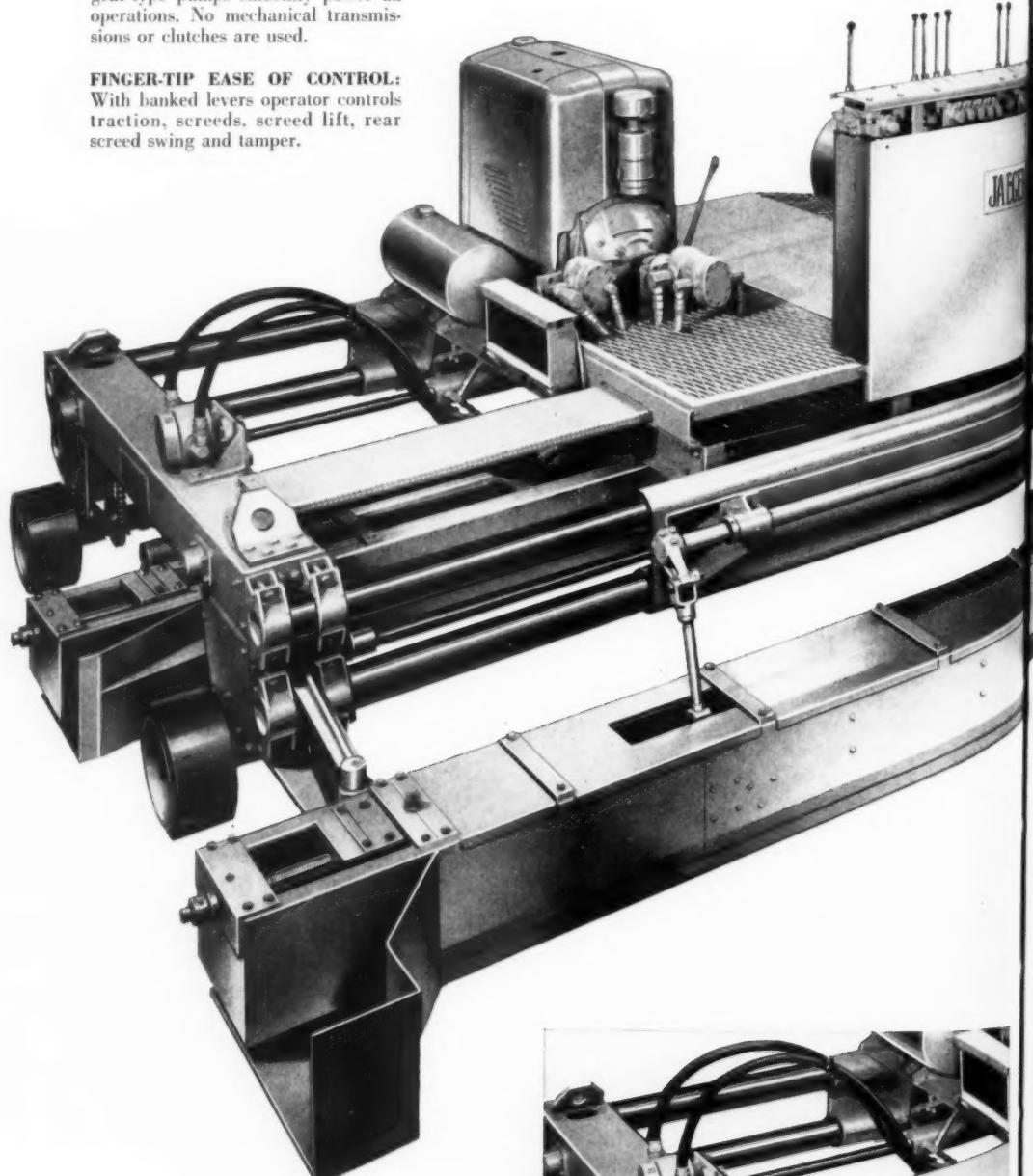
The plaster was mixed in an Anchor plaster mixer, set up on the floor where work was being done, dumped

into a mortar box, and shoveled by hand into wheelbarrows. Workmen wheeled the barrows up an incline and dumped the plaster into the hopper of an E-Z On plaster machine. The plaster was forced through a hose to an applicator nozzle that a workman used to apply the material directly to the walls, ceilings, and structural members. To apply the plaster to the ceilings and to the underside of floor beams, the workmen used a 30×6-foot Ezebilt rolling scaffold large enough to accommodate the man applying plaster and another man using a straightedge to true up the surfaces.

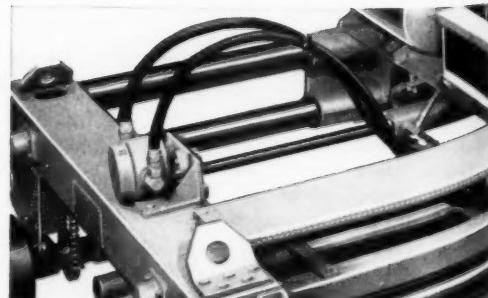
The E-Z On plastering machine operated on 240-volt electrical power supplied by an Onan 10-kw generator set. The gasoline-powered gen-

ALL HYDRAULIC OPERATION: 5 gear-type pumps smoothly power all operations. No mechanical transmissions or clutches are used.

FINGER-TIP EASE OF CONTROL: With banked levers operator controls traction, screeds, screed lift, rear screed swing and tamper.



ONE MOVEMENT CHANGES SCREED CROWN: The quick turn of a lever uniformly raises or flattens entire screed to desired setting. Big advantage on curves.



6' OF INFINITE WIDTH ADJUSTABILITY: Hydraulic power extends telescopic tubular frame any width up to 3' on each side — 6' total.

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erator was carried from floor to floor as the work progressed.

The exterior front wall of the building is faced with Spandrelite heat-resistant glass and aluminum skin panels. These wall units were supplied by Cupples Products, St. Louis, Mo., and erected by Steel Sash Service, Chicago.

The rest of the building has mostly masonry walls with large amounts of stone on the exterior, while many interior partitions are of clay partition tile. Much of the exterior stone is Alabama limestone with granite trim. The main entrance terrace has a granite step 84 feet wide with pylons of Cold Springs granite.

Much of the exterior stone was handled by American 104 and Sasgen hand winches on "grasshopper" port-

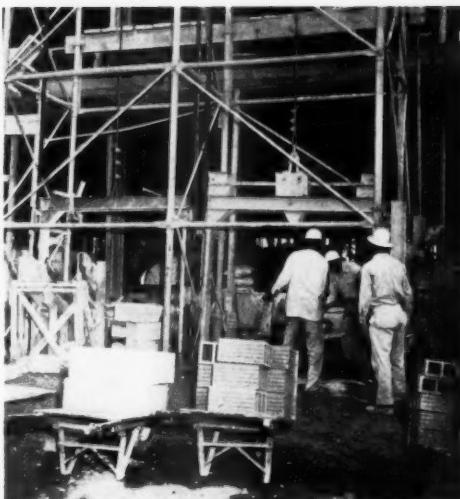
able mounts. Yale Midget King 1-ton electric winches raised and placed many of the lighter pieces of stone.

Mortar for the masonry work was mixed by two Essick mortar mixers. Mortar, stone, tile, brick, and other masonry materials were hoisted to the required floors of the building on the platform elevator of the Archer tower. This elevator, the concrete bucket, and a Chicago boom were handled by an American 3-drum hoist powered by a Fairbanks-Morse electric motor.

An unusual feature of the building is the location of the heating boilers and air-conditioning equipment on the tenth floor near the top of the structure. This leaves most of the basement for offices and storage.

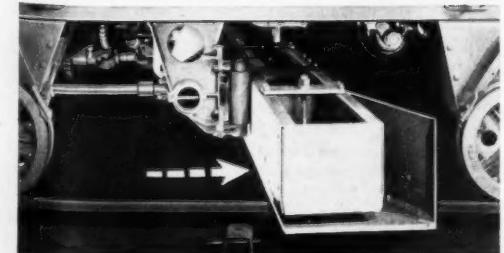
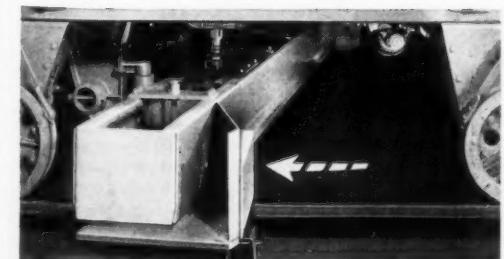
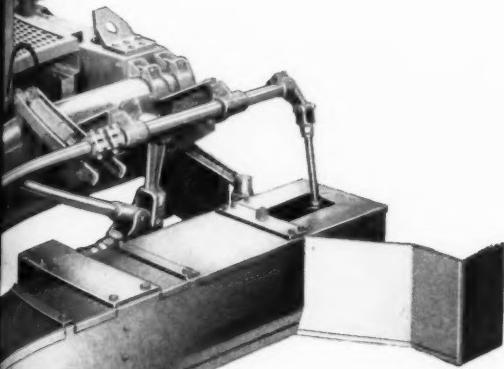
The supervisory staff for R. P.

The loaded Prime Mover is wheeled onto the platform of the Archer tower to be brought to a pour on one of the upper floors. Other building materials loaded on wheelbarrows wait their turn to be hoisted to workmen on other floors.



It's really *smooth*

Jaeger "JX" all-hydraulic self-widening finisher does fast precision-smooth finishing under finger-tip control



HYDRAULIC POWER SETS SCREED ANGLE: With a light touch, operator swings rear screed to any angle needed for up-hill finishing on pitched slab or curves.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242

JAEGER

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Co. of Canada, Ltd., St. Thomas, Ontario

Sales and Service in More Than 150 Cities of U.S. and Canada
and Principal Cities of the World

SPREADERS • FINISHERS • AIR COMPRESSORS • PUMPS • CONCRETE MIXERS



TEAMS BEST WITH JAEGER SPREADER: Screw-type spreader (with oscillating metering screed if desired) makes ideal combination for fast laying of slab.

Farnsworth & Co., Inc., included general superintendent Ray Louvier, concrete foreman Bill Thigpen, masonry foreman Alvin Bordenave, and project engineer Arthur S. Doyle. The superintendent of the pile-driving operations was Roy Lovell.

The superintendent for the architects and clerk-of-the-works was J. A. Peterson. He was assisted by Ruben Cambel. The installation of elevators and mechanical facilities was supervised by Sidney Lambremont. Mayor of the City of New Orleans is Chep Morrison.

THE END

Line of wheel tractors covers medium-duty field

A new line of wheel tractors with such attachments as loaders, backhoes, blades, fork lifts, mowers, sweepers, augers, and more than a dozen other accessories is announced by the Work Bulls Division of Massey-Harris-Ferguson. According to the manufacturer the new line of Work Bulls fills the gap between light and heavy-duty equipment.

Included in the line are the 52-hp Model 404, the 42-hp Model 303, and the 34-hp Model 202. All units are powered by gasoline engines and have 12-volt electrical systems. All are equipped with Tractormeters, which indicate speed, engine rpm, power takeoff speed, and the total number of hours worked.

The Models 404 and 303 have five forward speeds, up to 13.6 mph, and one reverse. The Model 202 has six forward speeds, with a top of 13 mph, and two reverse. The Models 303 and 404 are available with optional diesel engines and power steering. Dual, double-acting power steering cylinders are standard on the Model 202.

Among the attachments available for the Work Bull line are Davis front-end loaders up to $\frac{3}{4}$ -cubic-yard capacity, Davis backhoes with 12 to 36-inch buckets, a fork-lift, a front-end sweeper, a front-end crane, an angle dozer, a scarifier, and snow plows.

For further information write to the Work Bulls Division, Massey-Harris-Ferguson, Inc., Quality Ave., Racine, Wis., or use the Request Card that is bound in at page 18. Circle No. 54.



The Wagner IND-18 features dual controls and a reversible operator's seat. It has demountable wheels that can be replaced with compaction wheels.

Tractor has dual controls, reversible operator's seat

A 40,000-pound tractor featuring dual controls and a reversible operator's seat is the largest of a new line of prime movers available from Wagner Tractor, Inc. The operator does not have to turn the new IND-18 around for any operation, he just swings his seat around and begins maneuvering the machine with the second set of controls.

The rig's rubber-tire wheels are flexed so that they may operate on different levels while maintaining an even distribution of weight. The rig, which has four-wheel-drive and four-wheel-steering, can handle a dozer blade, a scraper, compaction rollers, or various wagons. According to the manufacturer, it can self-load scrapers without the need for a pusher.

Powered by a 200-hp diesel engine with a twin-disk torque converter, the IND-18 has demountable wheels that can be replaced with compaction wheels.

For further information write to Wagner Tractor Inc., 8027 N. E. Killingsworth, Portland 20, Oreg., or use the Request Card at page 18. Circle No. 56.

Text covers geotechnics and engineering geology

The main purpose of "Principles of Engineering Geology and Geotechnics", by Dimitri P. Krynyne and William R. Judd, is to inform engineers on what they should know about geology, and to provide geologists and other specialists of the earth sciences with a knowledge of those phases of civil engineering necessary for their work with engineers.

A unique feature of the book is the integration of geology with soil and rock mechanics. The first eight chapters of the book contain general geotechnical information applicable to any structure. The remaining chapters present the use of this information as an indispensable tool in the design and construction of buildings, bridges, dams, tunnels, and highways.

Equations, formulas, graphs, diagrams, charts, and tables supplement the written material of the 730-page book. A list of references appears at the end of each chapter; and an index of rocks, minerals, and soils, plus a general index, conclude the text.

Priced at \$10, the book may be purchased from the publisher, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N.Y.

Oversized pistons up engine hp 20 per cent

Engines equipped with its oversized piston assemblies will deliver 20 per cent more horsepower, according to M & W Tractor Products. Add-Pow'r pistons are available for most gasoline, diesel, and propane engines used in the construction industry.

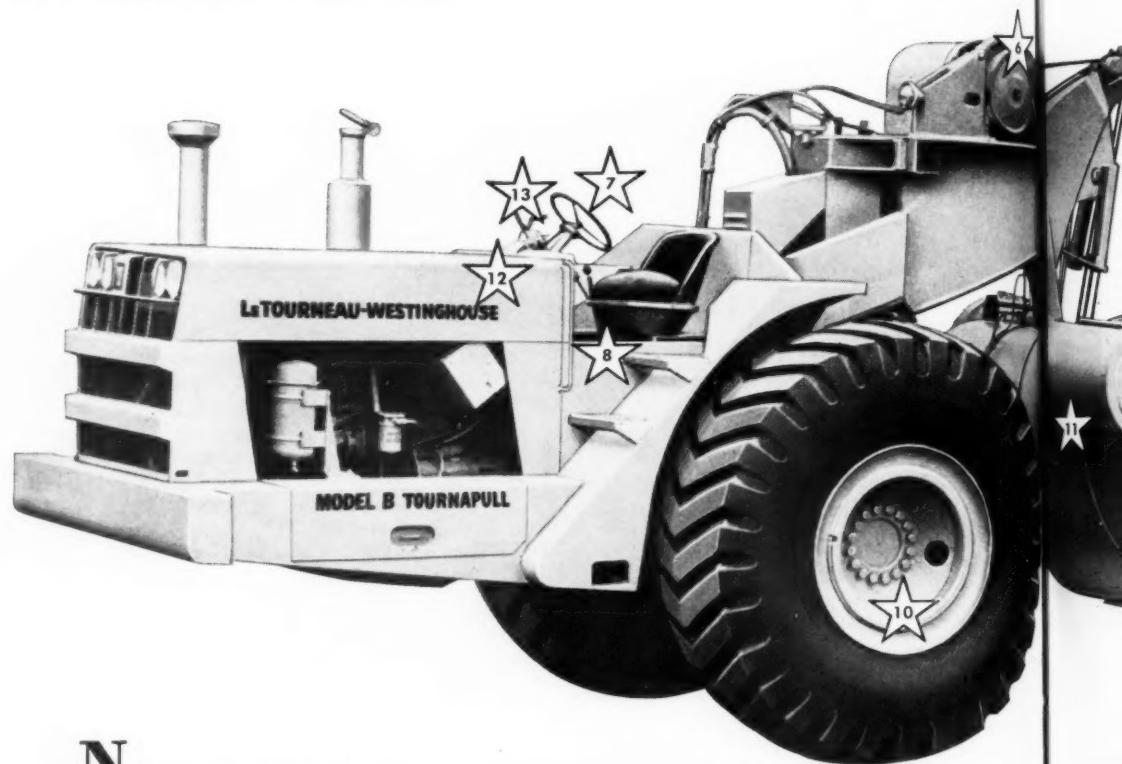
The pistons, perfectly balanced and matched with a centrifugal cast sleeve, the company reports, increase the engine's cylinder displacement and power. An engine with a standard 5 3/4-inch bore takes an Add-Pow'r

piston 6 inches in diameter, which increases displacement from 831 to 905 cubic inches.

M & W Add-Pow'r piston assemblies are available for Allis-Chalmers, Buda, Case, Caterpillar, International, LeRoi, Minneapolis-Moline, and Oliver engines.

For further information write to M & W Tractor Products, 5090 Green St., Anchor, Ill., or use the Request Card that is bound in at page 18. Circle No. 55.

NEW B Tournapull with



New, low, wide B Fullpak scraper gets big loads fast! This tested design is fully proven for fast and easy loading — has been in world-wide service for over a year on the modern 18-yd. Model C Tournapull. This companion 27-yd. Fullpak loads just as easy and heaps just as fast. Check it against any of today's big production units. Compare it for lowest-net-cost-per-yard.

Loads faster... boils better... offers many advantages:

The "low and wide" design of the new B Fullpak scraper gets full-capacity, low-void pay-loads fast. Side-sheets curve up in center to reduce spillage and deflect material into corners of apron and tailgate. Tailgate has a curved top to roll material into the heap, fill all corners. High, deeply curved apron adds dirt capacity and carries a big part of load forward in its "belly", for better weight distribution, lower center of gravity, and improved stability on any terrain.

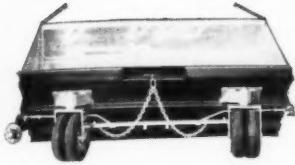
Low push-block gives direct-line application of power from pusher to blade. Bowl bottom has only 1° rise. In loading, dirt flow is nearly horizontal — big loads pack in fast.

Powerful, improved 293 hp Model B Tournapull prime-mover has the famous L-W power-transfer differential that keeps pulling-traction on both drive wheels at all times. Power-steer through geared king-pin permits 90° turns. This positive king-pin steer permits swinging prime-mover to let drive wheels find better footing and "walk" out of mud and loose sand.

Push-button electric control and wheel-operated electric steer make handling easy. All-weather electric motors at points of action give instant steering and scraper control.

Heavy-duty transmission provides ten gear ratios, from 2.6 to 28.4 mph. Low gear matches pusher speed, enables "B" to help itself in loading, gives full lugging power for pulling through soft footing. This combination of 10 speeds, plus clutch-brake for fast shifting, means hauling at higher speeds... more pay-yards per hour.

For full details on this new 27-yd. B Tournapull, see your LeTourneau-Westinghouse Distributor. Analyze your earthmoving requirements. See how this BIG "B" with new fast-loading Fullpak scraper can earn big dividends for you on future work.



Stone-bituminous spreader adjusts to 11-foot width

A stone and bituminous spreader from the I. J. Overman Mfg. Co. is available in three models, the largest of which will place material in lifts

up to 10 inches and widths of from 6 to 11 feet. According to the company, the spreader is able to place up to seven tons of material in two minutes.

The hopper has a capacity of three tons and a bottom opening of 9 inches. Right and left screed plates are adjustable for placing mats level with a crown, or with a reverse crown. The twin ball-bearing rollers are adjustable at the center to conform with the crown.

A dual vibrator assures free flowing of material from hopper to pave-

ment. Steering arms are hand-controlled and located on either side of the spreader. The rig rides on two pairs of pneumatic duals which permit turns up to 32 degrees to the right or left.

For further information write to the I. J. Overman Mfg. Co., 3301 So. Torrence St., Marion, Ind., or use the Request Card at page 18. Circle No. 59.

A report on last month's annual meeting of AHONAS in Atlantic City, N.J., appears on page 22.



The Challenge combination floating and troweling machine.

Finishing machine floats, trowels with same blades

A four-bladed machine that does both the floating and troweling operations without changing blades is available from the Challenge Mfg. Co. The machine features a hydraulically controlled blade adjustment that changes the pitch of the blades instantly, the manufacturer reports.

The blade adjustment is located on the dual handle, along with an automatic mercury shut-off switch and a speed control. Power is supplied by an air-cooled gasoline engine through a sealed gear box.

The machine is offered with 18 and 24-inch blades which are heat-treated for maximum service. A 3/4-inch stationary guard ring protects the blades and permits the machine to operate within one inch of obstructions.

For further information write to the Challenge Mfg. Co., 1849 E. Slawson Ave., Los Angeles, Calif., or use the Request Card at page 18. Circle No. 51.

HRB bulletin covers rough, slippery roads

"Road Roughness and Slipperiness, Some Factors and Test Methods", contains five papers presented at the Highway Research Board's 35th annual meeting in January of last year. The first paper deals with modification of the Bureau of Public Roads' roughness indicator as developed in California. This also includes some test results using the equipment on actual pavements. The second paper describes modifications developed in Minnesota for the same instrument.

The state of Virginia's experience with skid-resistant pavements is described in the third paper. This paper also contains the different test methods, and the results of stopping distance tests made at several hundred locations in that state. The program of skid testing in Indiana and the results of the tests are discussed in the fourth paper.

How passenger car speeds are affected by driver reaction to wet and dry pavement conditions is the object of the last paper.

Priced at \$1.60, the bulletin may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

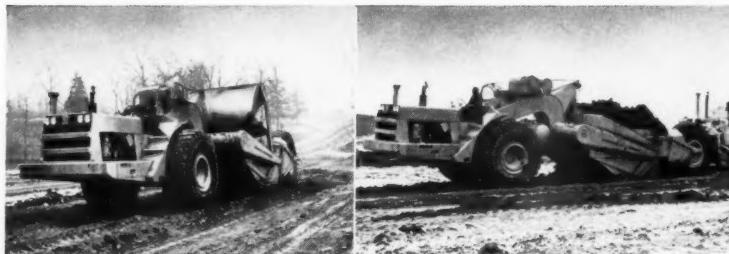
full with 27-yd. FULLPAK scraper

1. Low, wide Fullpak scraper: 27-cu. yds. heaped, 19.1 cu. yds. struck, 32.5 tons.
2. High-lift apron. Big opening (7'1" high 10' wide) makes sure anything that goes in will come out!
3. Deflectors on yoke arms, and smooth, wide apron side-arms, prevent trapping of rocks, and other chunky materials that might slow up operations and involve manual clearing.
4. Curved deflector on tailgate rolls dirt into center of bowl for bigger pay-load.
5. Streamlined bowl has no obstructions to interfere with flowing flow of material.
6. Large diameter cable-drum on apron-hoist permits fast spooling without kinking, increases rope life.
7. Power steering wheel gives easy handling through positive electric control.
8. Cockpit is raised to give operator clear visibility. He can see both load and pusher at all times.
9. Scraper wheels are easily removed, and interchangeable with wheels on prime-mover. Outboard bearings give stable load support.
10. Multiple-disc air brakes, and sturdy brake elements, give quick stopping power, longer service.
11. Heavy cross-tube ties side sheets rigidly together on low, wide Fullpak bowl.
12. Constant voltage transformer provides accurate control at low engine RPM.
13. Quick-release clutch and fast electric hoist allow rapid bowl "pumping".
14. Large push-plate, of all-welded, reinforced box-type construction, provides big pusher target, keeps contact over uneven terrain.



Brief Specifications for New B Fullpak Tournapull:

Capacity: Tons	32.5
Hopped, cu. yds.	27
Struck, cu. yds.	19.1
Power: 293 HP Cummins Diesel	
Tires (Std.): Four 27 x 33 - 30-ply rating	
Speeds: Ten forward 2.6 to 28.4 MPH	
Two reverse 2.4 to 3.5 MPH	
Turning Angle: 90° left or right	
Width Required for 180° Turn: 39'10"	
Control: Fingertip Electric	
Brakes: Multiple-disc air brakes with 6552 sq. in. of braking surface	
Dimensions:	
Length	44'0"
Width	11'8½"
Height	12'2¼"
Wheelbase	26'10"
Shipping Weight (approx. lbs.)	68,000
Specifications subject to change without notice.	



High-lift apron — positive ejection: Apron opens 7'1" to speed loading and unloading. Positive forward ejection of load wipes bowl clean of all materials, including mud and sticky clay. Low, wide bowl permits bigger heap, gives low center of gravity, provides greater stability in all working conditions. Smooth, wide side-arms and side-sheets of apron will not trap chunky materials that might hinder loading and unloading operations.

Low, wide bowl — heaps full-capacity, low-void pay-loads fast. Inside bowl is smooth, streamlined — has no reinforcement ribs to hinder dirt movement. Low push-block gives direct-line application of power from pusher to blade. Quick-release clutch, and fast, electric hoist, make possible rapid "pumping" of bowl for speedy loading of loose materials. Wheels inside cutting edge aid in precision grading, permit cutting against bank.

Tournapull, Tournapull—Trademark Reg. U. S. Pat. Off. BP-1388-G; Fullpak, Adams—Trademark

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Reader-Reply Card opposite page 18 and circle No. 243

APRIL, 1957

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Pier sections cast and set with improved techniques



Precast bases for the piers stand ready to be set for the new Columbia River crossing at Portland, Oreg.

Improved methods of prefabricating concrete pier sections are hurrying the job of constructing two bridges across the Columbia River at Portland, Oreg., to provide a 40-foot southbound lane for U. S. 99. When the work is finished, in June 1958, all northbound traffic will use existing bridges that parallel the new ones.

The \$6,681,000 Oregon State Highway Commission contract for the work was awarded to Guy F. Atkinson

Co., Portland and South San Francisco, which placed George T. McCoy, Jr., in charge of all field work. The Washington Toll Bridge Authority is also participating in the interstate job, handling certain phases of joint engineering and finance. The contract covers the construction of a large and a small span. The larger bridge, a 3,500-foot span, has a reinforced-concrete substructure and a concrete deck through structural steel trusses.

It spans the Columbia River. A 1,000-foot bridge of similar design, but having plate girders, crosses Oregon Slough not far away.

But though the new structures will be similar in appearance to the old bridges they parallel, there is no similarity in the method of their construction. The old bridges were built many years ago by the box cofferdam method. The technique being used for the new bridges is an improvement on

B.F. Goodrich on-the-job tire service

WE'RE AS CLOSE AS YOUR PHONE!

We service all tire sizes and types
on all kinds of jobs!

No matter how big the tire, how intricate the equipment, how complicated the repair job, we can handle it quickly, expertly. Our B. F. Goodrich Tire Service Men are trained for the specialized task of servicing off-the-road tires on the job. They can quickly mount and demount tires, repair tubes and valves, etc. You save costly downtime, cut tire costs to a minimum.

Without cost or obligation we will inspect all your tires. We'll select tires that should be repaired or replaced, point out tires that should be retreaded or recapped by factory-tested and proved B. F. Goodrich methods. We'll set up a proper inflation program.

The next time you need tires or fast, efficient tire service, call us.



COMPLETELY EQUIPPED SERVICEMOBILE

B. F. Goodrich Service mobiles are equipped with hydraulic cranes, power wrench, tube repair vulcanizers, a 20-ton jack and all other equipment needed for tire service work on the job.



See us for B. F. Goodrich off-the-road tires and service or check Yellow Pages of phone book for more complete listing in your area

Specify B.F. Goodrich tires when ordering new equipment

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GRON—B. F. Go

HN—B. F. Goodrich

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APRIL

(Continued from preceding page)

bed material down to the required elevation at each pier location was done by two rented American floating derricks built during World War II for use by the U. S. Army. The Owen 3-yard round-nose bucket used in this operation was powerful enough to scoop up almost any material on the river bottom, including boulders. When work was being done on either side of the river channel, the material was merely cast to one side. Dump scows were used to take dredged material away when work was done in the channel itself. The dredging work in Oregon Slough was done by a Bucyrus-Erie Model 24 steam crane, rented from Inland Navigation Co., which also used the Owen clamshell.

The wood piles at each pier location were driven by McKiernan-Terry 10-B-3 pile hammers operating under the river surface. On the job near San Francisco, one of the trickiest operations was the threading of steel H-piles through a precast base section that had been set. On the Oregon job, the wood piles being used are driven through an open template of the square-truss type. The template is usually floated into position on a service barge. As the barge is brought to rest against the downstream pier nose of the old bridge, steel spuds are sunk at each corner of the template, which is then jacked up to clear the barge. When the barge is floated out from underneath, the template is lowered into final position to act as a guide for the wood piling being placed.

The 10-B-3 pile hammers, handled by the floating derrick rigs, are equipped with a standard driving head, plus a discharge snorkel that exhausts steam above the surface of the water. Power for the pile hammers comes from the steam boilers on each of the floating rigs. The pile heads are being driven down to a calculated bearing point determined in foundation studies.

One of the unique operations at this stage of the work is the construction of three sets of two-pile supports for the heavy prefabricated base sections. A special angle-iron steel template, made for this work, is supported by a derrick rig that is guided by a diver working below the surface. Once this template is clamped into final predetermined levels on

each of the three pairs of piles around each bell section, a Mall air-powered saw snips the wood piles off to exact levels. Then these two piles are capped by a short span of 8-inch H-beam that carries the actual load of the shell. Later on, after concrete has been placed inside the shell, the main load is transferred to the many wood-pile heads that protrude up into the base.

Units prefabricated and set

Bases, bells, shafts, and connector beams are being prefabricated near the bridge site in a yard on the left bank of the Columbia River. The entire yard area is served by a traveling Colby gantry-mounted crane of the shipyard type which saw previous service at The Dalles Dam.

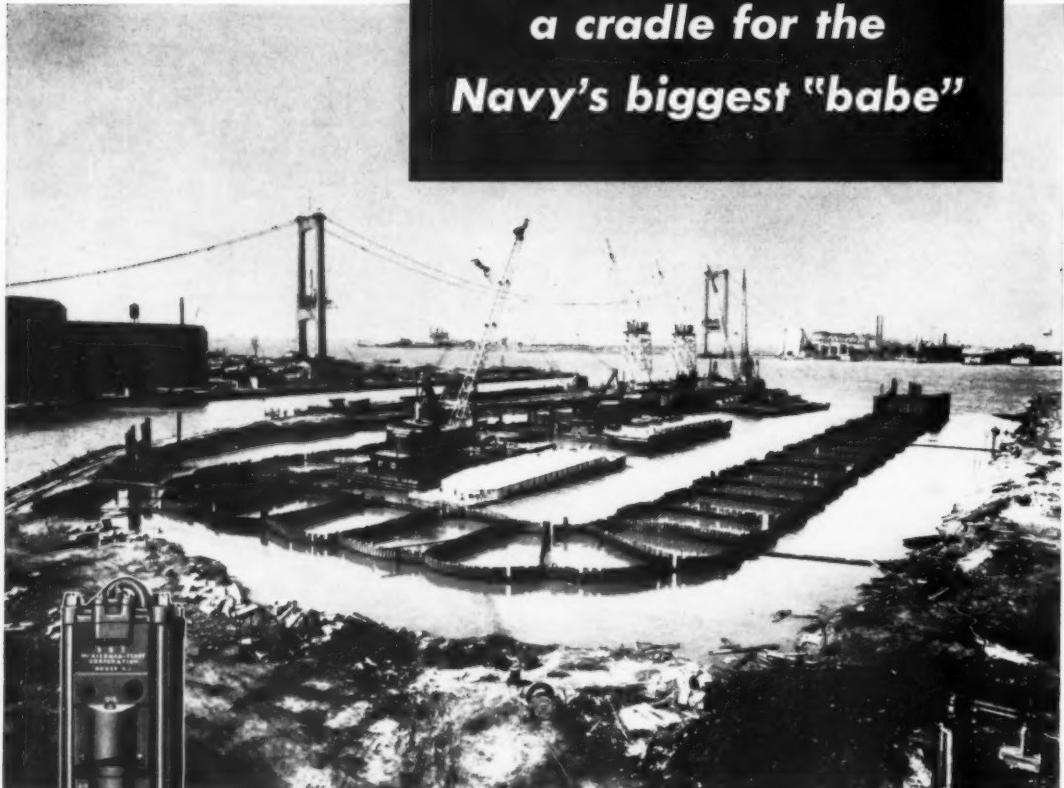
The central form design section of Atkinson's South San Francisco offices worked out a steel forming system for the 15 sizes of various sections. After being set on pouring bases, the forms are filled with concrete delivered by Challenge and Rex mixers from a local commercial concrete plant. The concrete is consolidated in the forms by Viber internal-type vibrators. When one of the units has been completed, plywood hoods are placed in position by the traveling gantry crane, and live steam is introduced under them for a 24-hour period. Main supply lines carry the steam under the hoods from a Littleford Bros. Co. automatic steam generator. This accelerates the concrete cure enough so that the units can be handled safely within about 48 hours of the time the concrete was placed.

One of the most difficult parts of the job is handling the shaft sections, which weigh between 50 and 70 tons. To do the best possible job in prefabricating these sections, it is necessary to cast them upside down. But since available cranes have a maximum lifting capacity of 80 tons, it is impractical to rig the lifts so that a shaft can be turned right side up in one operation. The job is being done in several steps. After a shaft is picked up, it is laid down flat, then transported by barge to the pier location. Here it is rotated and placed to its final position by a floating derrick.

In assembling a pier, Atkinson is setting the prefabricated base portion on the three-point H-beam suspension around the perimeter of the shaft. Selected gravel backfill is then placed inside the dredged area around the pier by a clamshell. This backfill comes to the bottom of the base. In some cases, this work is done before the base is set. War surplus LCM's bring Gar-Bro 4-yard buckets of concrete to a pier location, and the concrete is tremie-placed through a 12-inch steel pipe in a layer 5 feet thick around the pile caps and the bottoms of each base.

The prefabricated bell and shaft sections are then set, together with the reinforcing steel and fill concrete that makes each pier a solid mass, from the wood pile to a point above the water surface. The connector beams are then set and concreted in with the shafts. From that point on, prefabricated forms and cast-in-place

MCKIERNAN-TERRY PILE HAMMERS *help to build a cradle for the Navy's biggest "babe"*



It required 66 elliptical interlocking steel cells, each 36 ft x 54 ft, and 9 circular cofferdams to block out and seal off the graving dock in which the 60,000-ton Superaircraft Carrier Kitty Hawk is to be built by New York Shipbuilding Corp.

The dock is located on the Delaware River at Camden, N. J., and is the largest privately owned in the country. The contractor, Merritt-Chapman & Scott, used

McKiernan-Terry Pile Hammers, operated from four floating derricks, to assure speedy work in driving the 8,400 heavy steel sheeting for the cells and cofferdams.

On unusual jobs such as this, and on every-day pile-driving jobs as well, contractors all over the country have learned to depend upon McKiernan-Terry pile-driving equipment for effective and economical work. Write for catalogs.

McKiernan-Terry
9B3 Double-acting
Pile Hammer

MCKIERNAN-TERRY CORPORATION
MANUFACTURING ENGINEERS
82 Richards Ave., Dover, New Jersey

For more facts, use Reader-Reply Card opposite page 18 and circle No. 245

MK-394

CONTRACTORS AND ENGINEERS

concrete is used to complete each pier. When the pier work is finished, Judson-Pacific-Murphy Corp. will fabricate and erect the structural steel that will support the concrete deck of the bridge. This done, Atkinson will resume work, placing the 40-foot-wide deck for the span. THE END

Abrasive cleaning tool uses air pressure only

A portable blast cleaner that operates with compressed air and recovers abrasive for re-use is available from Clementina Ltd. The Clemco Educt-O-Matic weighs 7 pounds and takes 1 to 4 pounds of most common re-usable abrasives 40-mesh or finer. The unit requires 33 to 66 cfm of



The Clemco Educt-O-Matic holds a charge of from 1 to 4 pounds of abrasive cleaning material which it recovers for re-use.

air between 90 and 100 psi. It makes a blast pattern between 1 and 1½ inches in diameter. A swivel head permits blasting in any position. Special heads are available for edge cleaning and angle cleaning.

The Educt-O-Matic is recommended for removal of rust, scale, and paint; for preparing a surface for a new coating; and for cleaning welds.

For further information write to Clementina Ltd., 2277 Jerrold Ave., San Francisco 24, Calif., or use the Request Card at page 18. Circle No. 73.

Arc Welding Foundation has bridge design contest

The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, has announced a new bridge design competition offering a total of \$50,000 in awards for designs of welded highway bridges. The awards will be made to the best designs submitted for highway bridges that are or could become a part of the National System of Interstate and Defense Highways.

Any type of bridge either built or proposed can be submitted, providing it conforms to the general requirements of the Interstate and Defense Highway System. A total of 16 awards will be made with a top award of \$10,000. Designs will be judged on quality of detail, economy in material and labor, cost savings, and appearance.

The competition is open to all residents of the United States and its possessions. Information on the preparation of entries may be obtained from the James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio.

SEVERAL DESIGN CHANGES HAVE recently been incorporated into the Hopto Model 360 Full-Swing Digger, according to the Badger Machine Co. Changes in the ½-yard hydraulic backhoe include a new split hydraulic system for speedier, more efficient, cooler operation. Digging depth has been increased to 20 feet, and maximum ground reach has been upped to 30 feet. The modified Digger has been redesignated as the Model 360 57-90. It is the largest of 11 hydraulically operated Hopto units. For further information write to the **Badger Machine Co.**, W. Fifth St., Winona, Minn., or use the Request Card at page 18. Circle No. 60.



16,000 Hours without engine overhaul . . . made possible by **D-A LUBRICANTS**

"We went over 16,000 hours on a Caterpillar D13000 Engine in a Lorain 77 Shovel—without overhauling!" Tom Palazzi, Frank Palazzi & Sons, Inc.

**24-hour delivery
anywhere in the U.S.A.**



Leading contractors who standardize on D-A Lubricants, including Frank Palazzi & Sons, Inc., well-known New England contractor, expect—and consistently get—8,000, 10,000, 12,000 and even 16,000 hours of heavy-duty service from their engines between overhauls.

Frank Palazzi & Sons recently clocked more than 16,000 hours on a diesel engine without overhaul . . .

and this is no isolated example. The D-A Representative in your territory can show you case-history after case-history on outstanding performance and long engine life resulting from the use of D-A Lubricants. Many of these reports may well be from contractors whom you know personally in your own area.

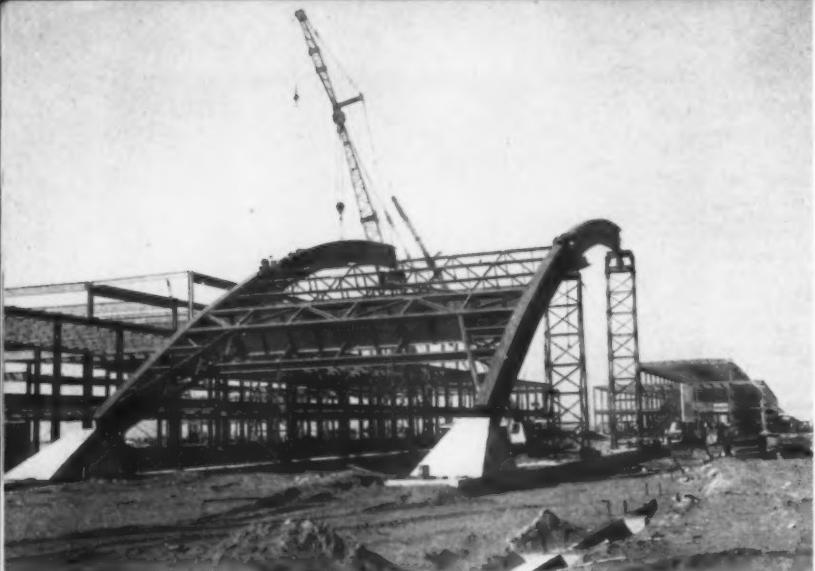
Ask your D-A Representative to show you the actual performance records . . . records you yourself can verify, if you wish.

D-A makes equipment last longer.



D-A LUBRICANT COMPANY, INC. • Indianapolis 23, Indiana

For more facts, use Reader-Reply Card opposite page 18 and circle No. 246



Three-hinged arch girders set on

Post-tensioning method stresses 286½-foot-long foundation beams; steel erector, setting 130 tons per 8-hour day, erects arched girders

Two sections for each arch are set in place, a Lima 802 with 80-foot boom and 20-foot jib holding one section while a riveted field connection is made.



Cold mix from stock pile being used for patching.

How To Assure Permanent Pavement Patching—Hot or Cold—in Any Season

CITY street departments as well as county and state highway departments throughout the country are becoming more and more sold on the extra value of McConnaughay Weatherproof Emulsified Asphalt for pavement patching. Mixtures made with these emulsions assure superior results in any season... cold mixtures used immediately or stock-piled for future use... hot mixtures for on-the-spot patching, particularly in cold weather. You can also depend upon these emulsions for durability in application types of patching.

You can be sure of fast, dependable service on asphalt emulsions and mixes by calling any of the McConnaughay Licensees listed. This co-ordinated group, guided by a central organization, is made up of experienced manufacturers and contractors who fully understand your problems, who offer engineering and testing services on paving materials and mixtures as well as on-the-job advice. For Specification No. 10 on Patching (or for any other Specification listed) write or 'phone your nearest McConnaughay Licensee or contact...



Winter patching: hot mix prepared with Emulsified Asphalt.



Any tar kettle with spray attachment will produce durable patches with proper use of Emulsified Asphalt.

McCONNAUGHAY LICENSEES Operating K. E. McConnaughay Emulsified Asphalt Plants

1. E. A. Mariani—Emulsified Asphalt Hooker's Point, Tampa, Florida
2. Bituminous Materials Co. Metairie, Louisiana Serving Alabama, Mississippi, and Louisiana
3. Asphalt Products Co., Inc. Powell Ave., Nashville 4, Tenn.
4. Bituminous Materials Co. P. O. Box 267, Terre Haute, Ind.
5. Wabash Valley Asphalt Co. Terre Haute, Indiana
6. Brookman Construction Co. 17th & Gharkey Sts., Muncie, Ind.
7. Fauber Construction Co. Lafayette, Indiana
8. Asphalt Materials & Construction, Inc. 960 E. 22nd, Indianapolis 2, Ind.
9. Ready-Mix Asphalt, Inc. P. O. Box 882, Fort Wayne 6, Ind.
10. Doherty and Swearinger Co. 53 Main St., Yarmouth, Maine
11. James Huggins & Sons, Inc. Medford & Commercial Sts. Malden 48, Massachusetts
12. Albany Asphalt & Aggregates 75 State St., Albany, New York
13. Knight Paving Products, Inc. 1655 Union Rd., Gardenville, N. Y.
14. Knight Paving Products, Inc. Vine Street, Ithaca, New York
15. Knight Paving Products, Inc. 1980 East Avenue, Rochester 10, N. Y.
16. Walsh Kelly R. R. #2, Gary, Indiana
17. Bituminous Materials Co. 416 S. Water St., Jackson, Mich.
18. Bituminous Materials Co. 318 Atlantic St., Bay City, Mich.
19. Emulsions, Inc. Lawrenceville, Illinois
20. Bituminous Materials & Supply Co. 415 Maple St., West Des Moines, Iowa Plants:
21. Spirit Lake, Iowa
22. Iowa City, Iowa
23. Menlo, Iowa
24. Emulsified Asphalt Co. Kuttawa, Kentucky
25. Bituminous Materials Co. Escanaba, Michigan
26. Knight-Bitumen Corp. Watertown, New York
27. Seaco, Incorporated 2700 Industrial Drive, Columbia, S. C. Eastern Representative: John A. Dow 157 Church St., New Haven 10, Conn.

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

- 1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching, 11—Mastic-Mix, 12—Driveway Construction

One of the last and one of the most important jobs for the foundation contractor on the \$29 million International Arrival and Airline Wing Buildings at New York's International Airport was the prestressing of the 286½-foot-long foundation beams that support the two triple-hinged arch girders forming the entrance to the structure.

This job was handled for the Port of New York Authority by Wortmann & Sons, Inc., New York, N. Y., the firm that built all the concrete foundations and drove more than 6,500 timber bearing piles for the structure. (See "Drive 6,500 timber bearing piles in airport modernization job". C&E, May, 1956, pg. 34.)

Before the work began on the foundation beams however, Wortmann drove timber bearing piles, to support the two beams, in two rows of 9 piles each under both of the beam abutments. Piles were driven to a 25-ton bearing and to an average depth of 25 feet. Additional piles were driven and capped with concrete footings to form four rows of column supports between the two arch foundation beams.

The columns resting on footings between the prestressed beams support a mezzanine—located within the arch itself about 48 feet below the center arch bin—that is at the same elevation as the first floor in the International Arrival Building; and a balcony along the four walls above the first floor. An elevated promenade, overpassing the horizontal canopy in front of the arch entrance will connect the mezzanine and the 11-story control tower that will be enclosed with a new facing and modernized.

Post-tensioning method

Work on the beams, which are on 60-foot centers, started as reinforcing was set. This consists of eight ¾-inch-diameter bars along the top and bottom and two on each side. Horizontal transverse bars, placed on 4-foot centers and held in place by two vertical rods, supported the post-tensioning cables.

With reinforcing set, the contractor placed the 21 Roebling post-tensioning cables, measuring .835 inch in diameter, which were enclosed in 1-inch-ID flexible metal hose. These

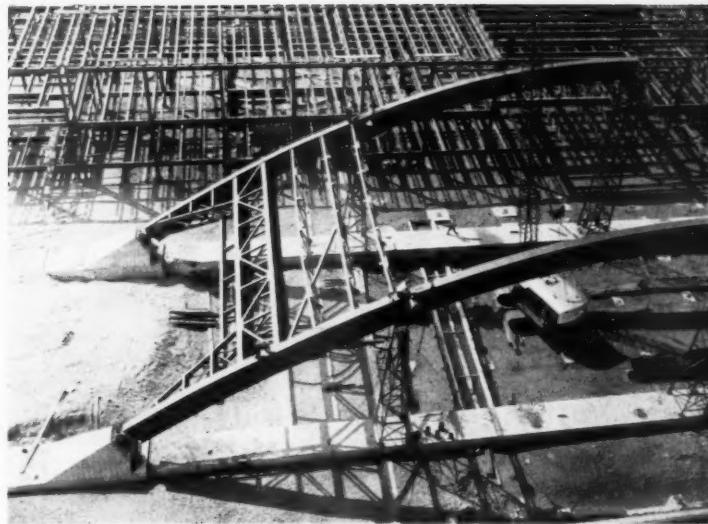
K. E. MC CONNAUGHAY LAFAYETTE INDIANA
EMULSIFIED ASPHALT PLANTS AND PROCESSES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 247

girders set on prestressed beams

form modern airport entrance

A Lima crane supports a 66-foot 6-inch girder section as a riveted field splice is made to the 62-foot-long section at one end of the foundation beam. The temporary steel falsework at the mid-point of each arch will remain in place while the falsework supporting the quarter sections is moved to the opposite side of the arches.



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post-tensioning tendons were galvanized to prevent rust scales from forming since they were not to be grouted until after the two arch girders had been erected. This plan made it possible for the contractor to make any adjustments—such as increasing the compressive force in the beam—after the steel arch had been erected.

The cables for each beam were positioned in three horizontal rows of seven cables each. Threaded cable rods on each end of the cables passed through 2½-foot-long sleeves attached to end-bearing plates. These sleeves, and the 30-inch-deep, 7-foot 3-inch wide, and 1¼-inch-thick end plates were embedded in the concrete abutments forming the end supports for the beams. These abutments are 27 feet long, 9 feet wide, and 4 feet 9 inches high. The beam connecting the abutments is 7 feet 6 inches wide and 2 feet 9 inches deep.

The abutments, which also support the end-connecting base plates of the hinged arch girders, were reinforced with 18 bars, measuring 1½ inch, which were spaced along the bottom block section of the abutment. Eleven 1½-inch bars were used as reinforcing in the upper section of the abutments, where the end connecting plates were attached.

Stressing pattern

The cables, passing through the sleeves in the end plates and held in position by washers and nuts tightened against the plate, were given an initial pull of 400 pounds to keep them from sagging even before concrete was placed.

After concrete for both beams had been poured and given ample time to cure, the contractor began the stressing operations. Two Simplex 10,000-pound hydraulic jacks, operated by Rogers hand pumps, were used so that stressing could be done simultaneously at both ends of a cable. Stressing was stopped once a cable had been elongated a total of 16 inches. Obtaining this elongation, corresponding to the desired load per cable, the contractor tightened the washer and nut against the bearing plate to transfer the load to the plates on either end of the beam.

A definite stressing pattern was set
(Continued on next page)

GREENVILLE ATECO LOADER and attachments for JOHN DEERE 420 CRAWLER

Here's America's biggest selling loader—designed specially for John Deere tractors. Proved on the job by thousands of owners. Unit has big reach . . . bucket clears 9' 5"—has 2' 6" reach in dump position and levels automatically as it raises. Bucket hinge pin adjusts for hydraulic tilt-back for fast loading with minimum spillage. Extra-heavy, lubricated pins and bushings at all hinge points are replaceable.

See it at your John Deere dealer's now.



SCARIFIER

Speeds loading; saves wear and tear on tractor and loader; accommodates five shanks equipped with inexpensive, replaceable points.



FORK LIFT

Mounts easily in place of bucket. 66" bulldozer blade and crane hook attachments available.



STANDARD BUCKET

Handles up to 3/4 cu. yd.; accommodates 4 teeth; large bucket for light materials handles up to 1 cu. yd.



GREENVILLE

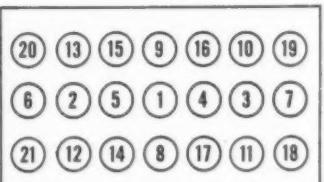
STEEL CAR COMPANY

ATECO DIVISION
Greenville, Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 248

(Continued from preceding page)

up by Precrete, Inc., Corona, N. Y., the prestressing consultants for the contractor, so that improper loading of the concrete beam cross-section was prevented. This is the pattern used during the tensioning of both beams:



During Wortmann's prestressing operations, the steel framework of the Port Authority's International

Arrival and Airline Wing Buildings was being erected by Harris Structural Steel Co., New York, N. Y., under a separate contract totaling \$2 million. By the time the three-hinged arch was ready to be placed on the two beams, most of the 6,500 tons of steel was in place for the buildings, which stretch the length of eleven city blocks.

Fabricate own steel

Harris fabricated all the steel sections at its New Market, N. J., plant, shipped the steel by rail to Jersey City, loaded it on a lighter for the short trip to Long Island City in the borough of Queens, and transferred it to trailer trucks that made the haul to New York International Airport. Each arch girder was shipped in four



Structural steel for the International Arrival Building is being set by a P&H crane, right, with a 90-foot boom and 30-foot jib.

Proved ways to boost output with an All-New Bucyrus-Erie Bucket



By providing better all-round performance, an All-New Bucyrus-Erie bucket on your dragline provides bigger output plus long-life dependability.

Fast Loading is possible because of the accurate balance designed into the bucket. Proper distribution of bucket weight helps teeth, cutting edge and the thin "slicing action" lip penetrate rapidly. Tapered basket also helps load fast and full.

Smooth Carrying results from proper flaring and balance of bucket. Bobbing and spilling is minimized.

Rapid Dumping is assured by the smooth inside design of the bucket and the high arch.

Durability is provided through use of BECOLOY, a tough fibrous alloy which has high impact resistance even at low temperatures, is readily weldable and is magnetic. It can be cut with an acetylene torch for fast field maintenance.

New design Bucyrus-Erie buckets are available in a wide range of sizes, with solid or perforated baskets for light, medium or heavy duty. Let your Bucyrus-Erie distributor recommend the right one for your requirements.

35R57

Familiar Sign
at the Scene of Progress

**BUCYRUS
ERIE**

SOUTH MILWAUKEE, WISCONSIN

BL-LIGHT
BM-MEDIUM
BH-HEAVY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 249

located about eleven feet above the ground. The contractor formed the canopies in front of the building and arch by erecting a 12 WF 53 column, about fourteen feet high, which acts as a center support. This was done by bolting two 10-inch channels, back to back, and straddling the column-forming cantilevers. Channel sections, connecting the cantilevers, were then bolted to form the outside face of the canopy.

Building framework

While the foundation contractor was prestressing the arch-girder supports, Harris kept busy erecting structural steel for the Arrival and the two adjacent Wing buildings.

Using the Lima 802 and a P&H truck-crane with 90-foot boom and a 30-foot jib, the contractor placed about 130 tons of steel every 8-hour day. This good production was made possible through the use of light lifts and bolted beam and girder connections.

More than 160,000 of both 1-inch and $\frac{3}{8}$ -inch high-tensile bolts, furnished by Bethlehem Steel and Russell, Burdsall & Ward were used. The 1-inch bolts were used for all girder connections, while the $\frac{3}{8}$ -inch bolts connected the beams and columns. Chicago Pneumatic impact wrenches and Ingersoll-Rand torque-control wrenches, calibrated to obtain any desired tension on the bolts, were used to tighten bolts at connections. Ingersoll-Rand air compressors powered by General Motors engines supplied air to the impact and torque-control wrenches.

Though the tallest section of the building reaches a height of 50 feet, no single column equals this length. The height was obtained by offsetting some columns and supporting them on top of beams. The tallest column sections do not exceed 35 feet. Roof spans consist of long span joints having a slight camber along the upper chord to offset the dead and live roof loads. The longest roof span truss, measuring 56 feet, had a 2-foot 8-inch depth.

To prevent the steel-hauling trucks from bogging down in the fine sand found at the airport, the contractor laid out rolls of Cyclone fencing over the haul routes. This provided a firm but flexible roadbed for the haul units.

Terminal city

The three-story International Arrival Building, approximately 760 feet long \times 415 feet wide, will handle all incoming international passengers requiring customs, health, and immigration clearance when it opens in June. Two 240-foot long, 2-story fingers will extend from either end of the building.

Adjacent to and connecting with both ends of the Arrival Building are the Wing buildings, also scheduled to be opened in June, which will house the ticket counters, lobbies and offices of the foreign-flag airlines serving the airport. The West Wing Building will be 600 feet long by 80 feet wide and have a 216-foot-long arcade ex-

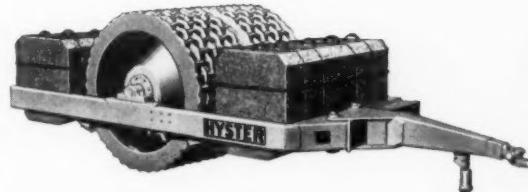
(Continued on next page)

A Simplex 10,000-pound hydraulic jack at this end, and one at the other end, prestress a Roebling post-tensioning tendon passing through one of the 286½-foot-long foundation beams. These beams support the girders forming the arched entrance for the International Arrival and Wing Buildings at New York's International Airport.



HIGH-SPEED COMPACTION LOW-COST ROCK CRUSHING EFFICIENT BITUMINOUS SALVAGE

**THE
HYSTER
"GRID"
ROLLER
DOES ALL
THREE!**



Here is the machine road builders all over the world are using on all types of road construction — free-ways, secondary roads, farm-to-market roads, access and logging roads.

Built for long life on any job—rock surfacing haul roads or high-speed compaction on expressways—the "Grid" roller is designed to give you low cost operation and maintenance. Its high capacity tapered roller bearings give long life. Its high-strength cast steel wheels resist wear in rock and abrasive materials. The heavy-duty frame prevents distortion in the toughest going.

"Grid" is the registered trademark for the Hyster open-surfaced roller.
Caterpillar is the registered trademark of the Caterpillar Tractor Co.

**For full details,
call your Caterpillar-Hyster Dealer.**

HYSTER COMPANY

**THE "GRID" ROLLER FOR
ALL TYPES OF ROAD BUILDING**



2952 N.E. Clackamas Street Portland 8, Oregon
1852 North Adams Street Peoria 1, Illinois
Portland, Oregon • Peoria, Illinois • Nijmegen, The Netherlands

For more facts, use Reader-Reply Card opposite page 18 and circle No. 250



1 EMBANKMENT COMPACTION — High-speed rolling (up to 15 MPH towed by Caterpillar DW15 Tractor) matches compaction with yardage of high-speed earth movers.



2 ROCK CRUSHING — Pit-run rock quickly and efficiently crushed for base and surface courses on secondary road construction and repair.



3 BITUMINOUS SALVAGE — Quickly breaking down old rippled-up mat, the "Grid" Roller salvages all of the original aggregate and reusable binder for use in new surface.

(Continued from preceding page)

tension. The East Wing Building will be 530 feet long and 80 feet wide and will have a 266-foot arcade extension.

The \$120 million Terminal City development within a 655-acre area will include, in addition to the Arrival and Wing Buildings, individual terminal buildings capable of accommodating 140 aircraft at one time.

Personnel

Frank Carey is the resident engineer for The Port of New York Authority, the bi-state agency of New York and New Jersey operating the area's transportation facilities. Mike Carvel was the foreman and Lamont Farrell, the assistant foreman, for Harris Structural Steel Co. Precrete,

Inc., had George S. Pinter as the pre-stressing consulting engineer who worked with Wortman & Sons during the prestressing of the foundation beams.

The general contractor on the International Arrival and Airline Wing Buildings, Cauldwell-Wingate Co., New York, N. Y., has Steve Koerner supervising construction. THE END

Erie Strayer appoints

James Patrick Godfrey has been appointed a district representative for the Erie Strayer Co., Erie, Pa. Godfrey will work with distributors, equipment manufacturers, and dealers in Tennessee, North and South Carolina, Georgia, Florida, Alabama, and Mississippi.



The new Ferguson nine-wheel 10-ton roller is powered by a 40-hp engine through a transmission with six speeds forward and two reverse.

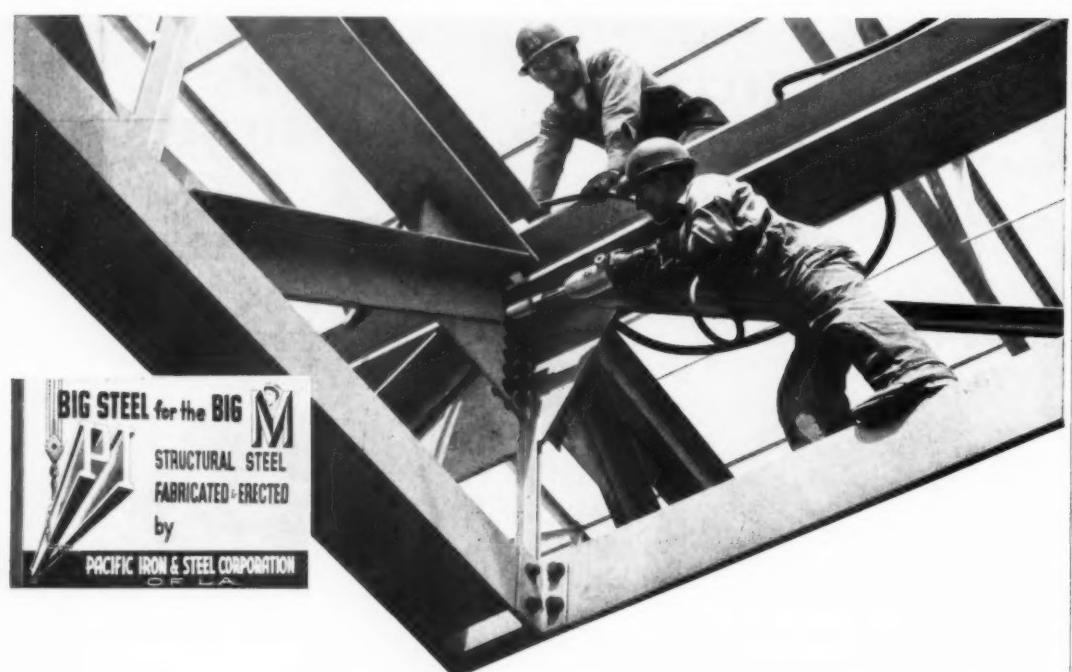
Two self-propelled rigs added to compaction line

■ Two new self-propelled rubber-tire rollers—a nine-wheel 10-ton rig and an 11-wheel 12-ton rig—have been added to the line of compaction equipment available from the Shovel Supply Co. The new Ferguson compactors feature removable disk wheels, hydraulic steering, and rigid one-piece steel bodies.

The 11-wheeler is equipped with a torque converter and straight-line reversing, which permits changes of direction without the use of a clutch. Both models are available with optional water sprinkling tanks and mats.

The 11-wheeler is powered by a 46-hp gasoline engine and has eight speeds forward and eight reverse. Its top working speed is 4.5 mph and its top travel speed is 12 mph. The nine-wheeler has a 40-hp engine, and six forward speeds and two reverse. Its top working and traveling speeds are also 4.5 and 12 mph, respectively.

For further information write to the Shovel Supply Co., 4900 Hines Blvd., Dallas, Texas, or use the Request Card at page 18. Circle No. 66.



88,000 BOLTS speed erection of "BIG M" plant

The Pacific Iron and Steel Corporation of Los Angeles used Ingersoll-Rand Torsion Bar Torque Control Impactools exclusively to run 88,000 high tensile steel bolts in the erection of the new Mercury plant in Los Angeles.

Here's Why Bolted Construction is Preferred.

Faster—twice as fast as riveting—one riveting crew can be divided to make two bolting crews.

Safer—no heating and tossing of rivets.

Stronger—high strength bolts provide considerably more clamping force than rivets... friction-type joint is superior to shear-type.

Here's Why Torsion Bar Torque Control Impactools are Preferred.

Positive Torque Control—steel Torsion Bar assures precision control of torque—minimizes inspection.

Cannot "Over Torque" Bolts—tool automatically shuts off when preset torque in Torsion Bar is reached.

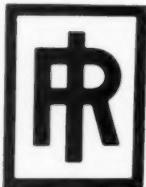
Adjustable Torsion Bar—easily changed to meet the requirements falling within its range.

Easy to Operate—no training is necessary.

Easy on the Operator—no buck, kick or twist is transmitted to the operator.

Low Maintenance—periodic lubrication will keep the tool on the job indefinitely—there's no clutch to slip or wear.

Call your Ingersoll-Rand Office for a demonstration of the New Torsion Bar Torque Control Impactool.



Ingersoll-Rand
11 Broadway, New York 4, N.Y.

Building construction costs topic of book

"Building Cost Manual", prepared by the Chicago Chapter of the American Institute of Architects and the Appraisers Division of the Chicago Real Estate Board, deals with the construction costs of 150 different types of buildings. The book includes introductory material on factors affecting building costs, depreciation, and regional variations in building costs. Over 80 case studies of building type costs are presented with all necessary data and photographs.

Every phase of building costs is described; the actual costs of the building are broken down by trades, and these figures are shown on the basis of square foot and cubic foot costs.

The book, priced at \$15, can be purchased from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

CONTRACTORS AND ENGINEERS

The Schenck hydraulic quickly ... system.

Tester hydra

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The Schroeder Model PT-50-B portable hydraulic tester is said to be able to quickly locate troubles in any hydraulic system.

Tester quickly discovers hydraulic system trouble

A portable hydraulic circuit tester that is said to quickly locate troubles in any hydraulic system is available from the Schroeder Bros. Corp. The Model PT-50-B weighs 19 pounds and is contained in a 7x11x9-inch case equipped with a carrying handle.

The tester is hose connected to the component port to be tested and to a low-pressure return line. Load is applied manually by the load valve with the result showing on the flow and pressure gages. Screens protect those circuits sensitive to foreign particles.

For further information write to the Schroeder Bros. Corp., Nichol Ave., Box 72, McKees Rocks, Pa., or use the Request Card at page 18. Circle No. 57.

Secondary crushing plants

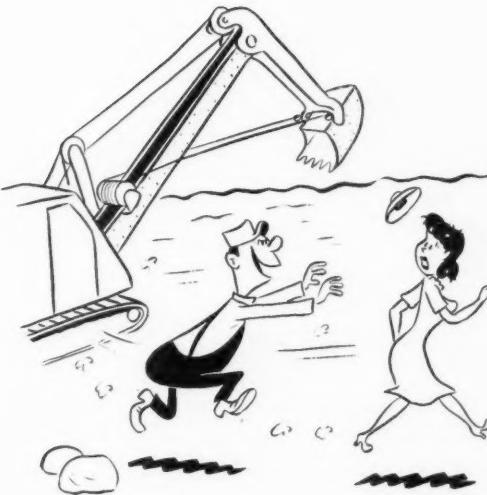
All-purpose secondary crushing plants for aggregate production are shown in a bulletin from the Gruendler Crusher & Pulverizer Co. Included are conventional or hammermill units for two-in-one crushing, double-roll crushers, jaw crushers, triple-deck vibrating screens, replaceable sectioned sand screws, and Tru-Flo flight-type sand drags. Complete specifications for all components of four portable plant models are shown.

To obtain Bulletin BR-35-1B write to the Gruendler Crusher & Pulverizer Co., 2915 N. Market St., St. Louis 6, Mo., or use the Request Card at page 18. Circle No. 9.

Crane Carrier buys firm

Crane Carrier Corp., Tulsa, Okla., has bought the Available Truck Co., Chicago, Ill. The acquired firm will be operated as a division of Crane Carrier. Available Truck makes heavy-duty trucks, mobile TV station carriers, buses for intra and intercity operation, and fire engines.

"So this is what you meant when you said you dig me the most."



...more evidence that Chevrolet Task-Force Trucks are engineered better and built better for bigger savings!

These cab features give you extra comfort and safety behind the wheel, extra savings on truck maintenance. And they're proof that the most modern trucks for your money are Chevrolets!

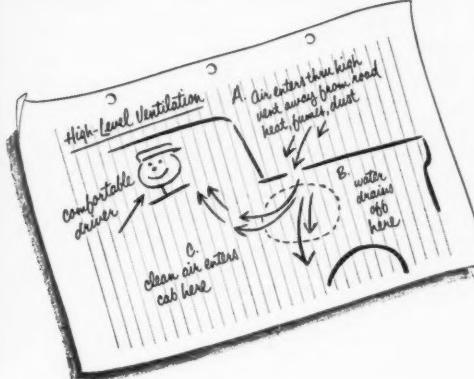
The drawing "doodled" above shows how Chevy's High-Level ventilation provides a comfortable interior . . . and the numbers in the big picture point out other advantages equally as good to have around you when you haul! They include:

1 A roof that's specially built for safer, more comfortable hauling. Sturdy all-steel construction adds to safety; roof's unique inner reinforcement insulates the overhead against heat.

2 A gleaming, durable baked enamel outside finish. Here's the reason your Chevy's exterior will resist wear better, look new longer! This handsome finish is available in a wide variety of colors.

3 A Nu-Flex seat that beats the bumps! Deep-comfort coil springs, metered air shock damping and 3-way adjustment let you take it easy on tough jobs!

in a Chevy cab, even the air is better!



4 A cab that's rustproofed to last! Doors and similar surfaces are rustproofed on the inside as well as on the outside by immersion.

5 Concealed Safety Steps for convenience. Inside each cab door, they give you firmer footing, make entering or leaving the cab easier and safer.

6 An undercoated floor, cowl side panels and fender flanges. Virtually all exposed surfaces on the underside of the cab are protected by an anti-rust coating.

7 A non-glare instrument panel to make driving safer! The textured finish on upper portion of Chevy's instrument panel reduces blinding sun reflections, minimizes eyestrain.

8 A reliable 2-speed electric windshield wiper* on each side. Powered by electricity, their action remains constant under all conditions.

Such advantages as these (we've shown only a few) combine to make everything better in a 1957 Chevrolet truck! You'll see for yourself when you visit your Chevrolet dealer's . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

*Standard in Series 5-6-7-8-9-10000 models.

... biggest sellers because they're the biggest savers!



CHEVROLET TASK-FORCE 57 TRUCKS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 252



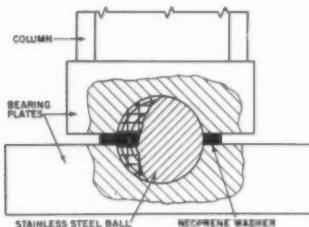
The relative size of an 11½-inch-diameter steel ball, of the type used in the ball-joint bridge support columns on the Indiana Toll Road is shown in comparison with an ordinary ball bearing. Grooves in the steel ball are in three directions to provide space for lubricants.

Stainless steel balls support toll road bridges

Stainless steel balls, used in joints at the top and bottom of bridge columns on the Indiana Toll Road, are saving on construction costs and giving spans a simplified design and an improved appearance. The columns, developed by Harry A. Balke of Harry Balke Engineers, Cincinnati, Ohio, carry the vertical loads between the end supports and permit maximum use of the area under the bridges.

In most cases the two ball-joint columns of relatively small cross section replace either one very large concrete pier or two smaller piers. The columns are so located that the floor beams are square with the bridge, permitting a simpler structure and, at the same time, eliminating diagonal floor beams and a complicated layout.

This type of support is made possible by a horizontal truss beneath the floor beams of the bridge, which provides lateral stability and eliminates bracing between columns. The



This sectional view of a lower joint in a bridge column shows how the Neoprene washer, compressed between the two bearing plates, seals out foreign matter and retains the graphite lubricant throughout the life of the bridge.

horizontal forces are transferred to the ends of the bridge, where they are delivered into the substructure.

With this type of construction, a bridge is subjected to transverse deflection due to applied forces, in addition to the longitudinal deflection due to temperature changes. Thus, the supporting ball-joint columns provide a freedom of movement without subjecting the columns to high bending stresses.

The balls used on the Indiana Toll Road are hot-forged Type 410 stainless steel, heat treated to a Brinell hardness of about 240, and grooved in three directions to hold graphite paste lubricant. The two bearing

plates are of structural steel of 140 to 150 Brinell hardness, with the hemispherical sockets machined to a radius 0.01 inch larger than that of the ball. A Neoprene washer, around the ball, is compressed between the two bearing plates, to exclude foreign matter and retain the graphite lubricant throughout the life of the bridge.

The 11½-inch-diameter balls, made by Industrial Tectonics, Inc., Ann Arbor, Mich., weigh 230 pounds each.

Bridges using the stainless steel

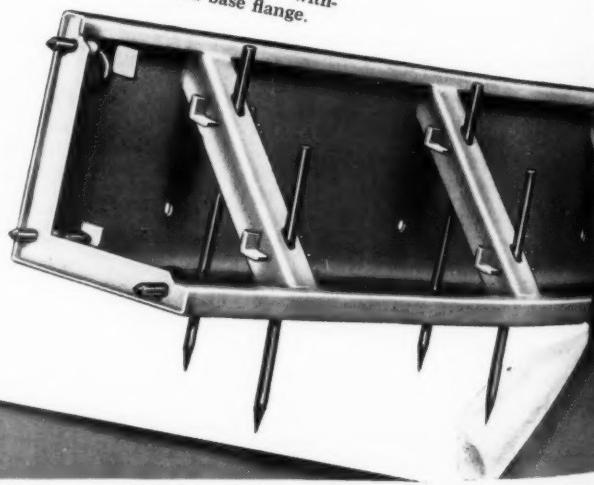
balls carry the Indiana Toll Road and the South Shore Railroad over railroads and streets in Gary and Hammond, Ind. This work, included in an Indiana Toll Road Design Section, was designed and supervised by a joint venture composed of three engineering firms: Richardson, Morehouse, Ramsey & Fisher of Pittsburgh, Pa.; Moran, Proctor, Mueser and Rutledge of New York, N. Y.; and Harry Balke Engineers of Cincinnati, Ohio.

THE END

Here's the greatest Steel Fo
....ever offered!!



Redesigned Road Forms engineered by America's foremost form builder, are stronger, easier to align, faster setting than ever before. Built to contractors specifications, these new forms will take plenty of punishment and give years of service. They are now available with or without upturned base flange.



Heltzel's husky Dual Duty Forms have long been the favorites of contractors who build airport runways and ramps. These forms come in a number of double faces to enable contractors to pour two slab thicknesses with the same form.

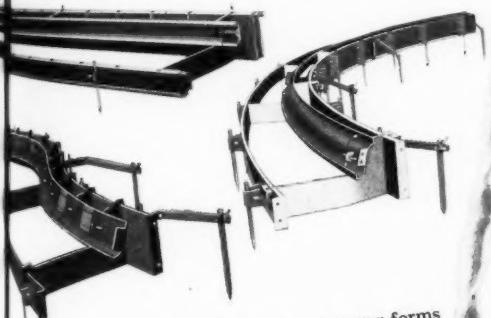
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A SPECIAL TRAILER for transporting and launching a complete bay of a floating bridge has been developed by the U. S. Army Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va. Towed by a standard 5-ton truck, the trailer features a tilting bed with rollers which facilitate the launching of an assembled bay into the water. The rollers can be locked to prevent rotation while transporting a bay, and retracted to provide a flat bed for an unassembled bridge bay. After the bay slides into the water, a power boat maneuvers it into position.



Free Form Value

CURB AND GUTTER FORMS



Heltzel builds the widest variety of curb and gutter forms in the industry. Straight, flexible or rigid radius forms in any face and style. You'll want to know about the combined curb and gutter forms with the interchangeable sections that permit many styles from the same basic sections... a real cost saver!

SIDEWALK FORMS



Here's an improved design sidewalk form with built-in Heltzel quality that assures lifetime performance. Division plate slots are spaced in one foot increments for better pouring practice.

HELTZEL

STEEL FORMS



THE HELTZEL STEEL FORM AND IRON CO., 401 THOMAS RD., WARREN, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 297

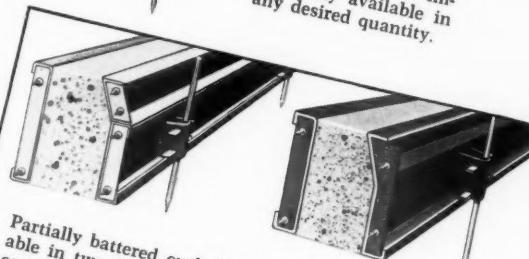
APRIL, 1957

CURB FORMS

Heltzel Curb Forms now have full length stake pockets that add to form rigidity—make staking faster, more positive. Forms are made of prime steels



that have rerolled rail stakes. Battered rail straight face in straight, fixed or flexible radius styles immediately available in any desired quantity.



Partially battered curb forms are available in two different types. Contractors can have either the single or two piece form. Both have the strength and ruggedness that is typical of Heltzel Steel Forms.

Adjacent forms for adding curbing to slabs already in are available in the widest variety of combinations.

SPECIAL FORMS

Whatsoever your forming needs it pays to specify Heltzel Forms. Heltzel will build forms to meet any specifications—for islands, foundations, driveways, piling, etc. Literature available on all form types and styles.

Vibrating feeder powered by pneumatic mechanism

■ A vibrating feeder in which the vibrating force is generated by a pneumatic drive mechanism is announced by the Cleveland Vibrator Co. It is completely metallic and is available in pan, trough, or tubular construction, with a selection of lengths and rates of feed.

A wide variety of materials such as cement, sand, and gravel can be



In the new Cleveland vibrating feeder, the vibrating force is generated by a pneumatic drive mechanism.

handled by the Cleveland feeder. According to the manufacturer, the pneumatic vibration permits the feeding of certain materials at an uphill slant of as much as 20 per cent.

Rates of feed are easily changed and adjusted. The frequency of vibration is selected by varying the operating air pressure over a range of from 30 to 90 psi. The feeder has only one moving part in the drive mechanism, with no cams, bearings, belts, or gears.

For further information write to the Cleveland Vibrator Co., 2850 Clinton Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 36.

Material-handling line

■ "Masonry Materials on the Move", a booklet from the West Brick Corp., shows the company's masonry material-handling line in operation. According to the firm, its rigs save up to 75 per cent in material-handling costs and up to 15 per cent in over-all masonry costs on every job under any condition.

Included in the West material-handling line are the Skytrak 445 hydraulic front-end fork lift for mounting on a wheel tractor, the three-wheel standard Brick Buggy that can handle a 240 brick pallet load, the Half Brick Buggy that is only 29 inches wide, the Half Hi-Lift Brick that will raise its load to a height of 90 inches, and the Mortar Buggy that will hold a 6-cubic-foot load.

Diagrams illustrate scaffolding arrangements that will assure ample room for maneuvering the West buggies. Numerous on-the-job photographs show the West line of equipment in operation.

A section is devoted to the split pallet method of stacking materials. The split pallet consists of a pair of 16×24-inch pallets banded together. The Skytrak 445 and the standard Brick Buggy can handle the banded pallets. With the smaller West rigs, the bands are cut and the split pallets are handled one at a time.

To obtain this booklet write to the West Brick Buggy Corp., 4310 Mayfield Road, Cleveland 21, Ohio, or use the Request Card at page 18. Circle No. 3.



Two units of the huge grain terminal dominate the harbor slip as they near completion. Workmen atop the 60 bins build forms for the concrete deck that will roof the facility. These units are less than a quarter of the 244 bins included in initial construction of the harbor project.



Untreated timber piles 30 to 35 feet long are driven at the dewatered site to form the footing for an elevator. The Lima crawler, using a Vulcan hammer, works from a mat on the soft ground. In the background, rigs work on the steel sheet-pile walls of the slip.

Grain elevators built with slip-form technique

**Conveyor with six discharge points places concrete
for base slab; slip forms for 244 storage elevators
lifted by pneumatic jacks**

by RALPH MONSON, field editor



Using a drill powered by the Homelite generator, foreground, a workman drills holes in the piling so that the reinforcing mat for a bank of bins can be supported. The Manitowoc crane is removing pile cutoffs.



Concrete for an average base slab, measuring 100×175 feet and 40 inches deep, is placed in one continuous pour of more than 2,000 cubic yards with a specially equipped Barber-Greene conveyor. The 24-inch belt, 52 feet long, is inclined so that the discharge end is 5 feet higher than the receiving end.



A Jaeger and a Smith transit-mix truck chute concrete to the hopper at the end of the belt, while the Smith mixer at left discharges directly into the forms. As concrete is placed, the rig rolls along the length of the slab.

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The nine prime contractors working on \$20 million worth of construction contracts have made Chicago's Lake Calumet Harbor one of the busiest construction spots in the country. All the work in this relatively small area represents the first phase of a \$200 million program that will provide the windy city with a huge harbor located about 6 miles inland from Lake Michigan.

The largest project in this phase of the work is the construction of two big grain elevators, each with a capacity of 6.5 million bushels. The contract for the design and erection of the two elevators, awarded to James Stewart Corp., Chicago, on a low bid of \$11.6 million, is scheduled for completion July 1.

Other projects in the first phase include dredging and dock construction, site grading, and the construction of sheds, offices, and warehouses. Future work will create a deep anchorage basin 2 miles long and 800 to 1,000 feet wide, plus 10.5 miles of dock facilities.

The new harbor has a particularly strategic location on Lake Calumet, which is joined to both the Great Lakes and the Mississippi River waterways. Its deep-water channel leading out into Lake Michigan opens the harbor to all shipping that enters the Great Lakes through the new St. Lawrence Seaway. The improvement of the Calumet-Sag Canal, currently

being done, will provide access for barge traffic from Lake Calumet directly into the Mississippi Waterway System.

The port facilities, including the big new grain terminal, are planned for the merger of several types of transportation. Facilities are being planned so that shipments can be handled by rail, truck, barge, and ship. There is probably no other place in the country where all of these facilities can be so well integrated.

The project is being planned and coordinated by DeLeuw, Cather & Co., Chicago, as consultants to the Chicago Regional Port District. The District was created by the Illinois Legislature and empowered to issue revenue bonds repayable from earnings of the port.

Dredging and grading

Within a few days after the sale of the bonds, Great Lakes Dredge & Dock Co., Chicago, moved in to start dredging the harbor and building the first slips. Hydraulic dredges sucked up the mud and clay from the bottom of the lake and deposited it to build up land for the port facilities. Walls of heavy sheet piling were driven around each of the 500-foot-wide slips that were created.

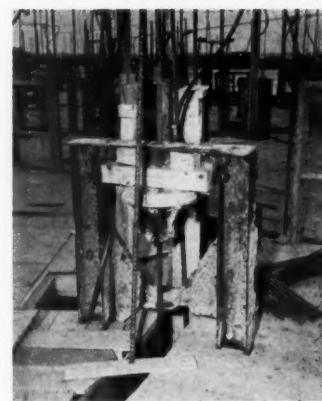
Working just behind the dredging contractor, the George Krug Excavating Co., Blue Island, Ill., and Charles J. Wilson Co., Chicago, be-

gan a \$1.7 million site-grading contract. Using six C Tournapulls and six Caterpillar D8 tractors with Cat 80 scrapers in addition to several draglines, this contractor completed about 200,000 cubic yards of site excavation. A fleet of 40 or more trucks then brought in slag from the nearby steel mills, together with sand, to build about a million cubic yards of granular fill in the lake to provide 150 acres for the construction of the various facilities.

Work on the big elevator contract got under way with the construction of an impervious dike surrounding the construction area. The Krug and Wilson firms subcontracted for this dike and the excavation for the elevator footings.

Since the area was a mass of wet clay partly under water, it was next to impossible to operate any kind of equipment at the site. The grading contractors started by bringing in slag and sand fill that would provide a footing for their equipment. Then the contractors built and compacted an impervious clay dike around the area so that they could dewater the actual building site.

Once the water level had been lowered, the contractors excavated much of the sand and slag they had hauled in, plus some of the lake-bottom clay to get the elevator footing areas down to an elevation of about 1.5 feet below water level.



About 225 of these pneumatic jacking units, supplied by Minot Builders Supply Co., St. Paul, Minn., are used on each section of slip form. The jacks are actuated to raise the form a pre-determined distance.

Contains 244 bins

The two big elevators are located on opposite sides of one of the 400-foot-wide slips of the harbor. Each elevator contains 122 bins, each of which is 24 feet in diameter and 135 feet high. The bins stand on heavily reinforced concrete slabs 40 inches thick. These two bases rest on 24,000 untreated timber piles driven into the lake bottom.

Each elevator has a workhouse that rises to a height of 228 feet above the footings. Automatic car dumpers provide for the quick unloading of rail cars, and similar fa-



Each of the five fixed discharge chutes has a baffle controlling the flow of concrete. Here, each of the baffles for the first four chutes is up, allowing concrete to ride the belt to the fifth chute. The fifth baffle, in the down position, shunts concrete down the last chute in line.



Workmen assemble the floor of the slip form—the working platform from which concrete is placed. This will become the roof form when the slip form reaches the top of the bin. The Michigan motor crane, background, places steel members.



As the slip form starts to rise, crews complete the assembly of a 169-foot-high Archer tower that will be used to hoist concrete to the deck during later stages of the concrete work. In the background stands a similar tower.

(Continued from preceding page)



cilities speed truck unloading. Each elevator has two marine legs for unloading ships and barges and six loading spouts for marine loading.

A subcontract for driving the 24,000 untreated timber piles was awarded to N. S. Mackie Co. and D. C. Cameron, Inc., both of Chicago. These contractors brought in three Bucyrus-Erie 38-B's, a Manitowoc 2000, and a 2½-yard Lima crawler

crane to drive the piling. The cranes, working from mats on the soft ground, used Vulcan steam hammers in swinging leads to drive the piles. The piling, ranging from 30 to 35 feet in length, was cut off below water level so that the entire length of all the piles will always be submerged. McCulloch and Homelite chain saws were used to make the pile cutoffs.

Conveyor places concrete

Workmen use Mall mechanical and Jackson electric vibrators to work concrete into place as it is chuted off the end of the belt. Both ends of the conveyor are supported on frames that have wheels positioned perpendicular to the direction the belt travels. The wheels run on plank runways for the length of the pour.

The elevator bins were built in groups of 28 or 32 to a unit, and the heavy base slab for one of these units was placed in a single continuous pour. The average size of one of these sections was about 100 feet wide, 175 feet long, and 40 inches deep, and most of the pours were in excess of 2,000 cubic yards of concrete.

To place this volume of concrete quickly and economically, Stewart used a specially equipped Barber-Greene rolling conveyor. This 24-inch belt conveyor, 52 feet long, was mounted in a slightly inclined position so that the discharge end was about five feet higher than the receiving end. An adjustable chute at the discharge end of the belt carried the concrete on beyond the end of the belt. Five fixed-discharge chutes, at intervals of about 8 feet along the length of the belt, also carried concrete from the conveyor.

A manually operated gate or baffle was mounted above the belt at each of the fixed discharge chutes. When this baffle was brought down in contact with the belt, concrete was deflected into the corresponding chute. When all of the baffles were raised, concrete was carried to the end of the belt.

The receiving end of the belt contained a small hopper, capable of being filled by two or even three ready-mix trucks simultaneously. The hopper helped maintain a uniform flow of concrete onto the belt and reduced spillage to a negligible amount. Since it was possible for the transit mixers to discharge to the hopper while standing as many as three abreast, there was never a break in the continuity of the flow of concrete onto the belt as long as one or more of the ready-mix trucks were on hand.

Supporting the belt near the two ends were frames carrying wheels mounted perpendicular to the direction of travel of the belt. Plank runways, built up over the reinforcing steel mat to carry these wheels, made it possible for the entire conveyor assembly to be rolled ahead as the form was filled.

By this method, 20,000 cubic yards of concrete for the base slabs was placed at an average rate of about 100 cubic yards per hour. Working at maximum capacity, the belt placed more than 150 cubic yards per hour.

Three types of vibrators were used to work the concrete down through the reinforcing steel. Two were the mechanical types made by Mall and Roeth, and the third was a Jackson electric vibrator.



Compact rugged Cleveland's smooth crawler mounting real public relations asset in 70,000' tough digging

The light weight, hi-tensile alloy steel construction and smooth crawler mounting of this Cleveland 92 "Baby Digger" enabled Rich & Co., Bradford, Pa., to cut 70,000 feet of trench in stony tough digging without causing damage to the sidewalks and fine old lawns in and around Groton, N. Y. The compact design and quick-and-easy maneuverability of the 92 were other big helps in digging these 4-inch pipe gas mains and laterals for New York State Electric and Gas Co., Ithaca, N. Y. The rugged 92 weighs only 10,000 pounds, is only 4½ feet wide over its crawlers, yet digs 10 to 20 inch trench widths and down to full 5 feet deep—in all soils.

Stones and rocks made digging tough.

The 10,000 lb. 92 treads lightly on lawn and sidewalks.



Compact 92 can put trench within 20' of side obstructions.



Good

Everywhere

THE CLEVELAND TRENCHER COMPANY

20100 St. Clair Avenue

Cleveland 17, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 253

These base slabs, which form the floors as well as the foundations of the bins, were troweled with Master Turn-A-Trowels and then given a light brush finish to provide a non-skid surface. The slabs were cured with Servicised white-pigmented curing compound applied with a hand spray. Ready-mixed concrete for the entire job was supplied by Material Service Co., Chicago.

Slip forms build bins

The storage bins were formed and placed in groups of 28 or 32 by the slip-form method. The forms were 4 feet high and faced with vertical 1-inch boards. Backing up this sheathing were laminated wood wales cut to the radius of the bins from segments of 2-inch plank. Steel beams spanned across the diameter of the bins to provide support for the walking deck, and later, the roof forms.

The entire form, except for the wall openings, is decked over with 2x6 joists and 1-inch sheathing. This deck forms the working platform for the crews placing concrete and operating the slip forms, and will become the form for the roof slab when the slip form reaches the top of the bins. A Michigan Model TMDT16 motor crane worked with the crew building the slip forms, aiding particularly in the placing of the steel members.

To raise the slip form, Stewart used Minot pneumatic jacks supplied by the Minot Builders Supply Co., St. Paul, Minn. These jacks have a pneumatic cylinder which raises the jack on the jacking rod an increment of 5/16 to 3/8 inch each time the jacks are actuated. The jacks, operated in groups from a central control panel, can also be operated individually to correct differences in elevation. An Ingersoll-Rand 215-cfm Gyro-Flo compressor operates the entire system.

One of the slip-form units forming a section 4 bins wide and 7 or 8 bins long required about 225 of the jacks. More than 500 of the jacks are on hand so that more than one of the units can be under construction at a time. The 1-inch-diameter jacking rods that carry the jacks and the form are spliced together into continuous units as the form rises, and these are left in the concrete.

An accurate control of the level of the form is maintained by a system of water-level gages. The system consists of sections of clear plastic hose filled with colored water and carried up to a predetermined point beside each of the jacks. Workmen can tell at a glance if any one of the jacking points is higher or lower than the others.

Tower bucket raises concrete

Concrete is raised to a slip form by an Archer hoisting tower. Three complete towers, each 169 feet high and consisting of 26 sections, are required to keep the work under way on the several sections. Each tower is fitted with a 1½-yard Archer bucket that discharges into a 1-yard Archer hopper on the deck of a slip form.

As the form rises, an adjustable chute compensates for the differences in distance between the dumping point of the tower bucket and the elevation of the hopper on the form. Each day, the bucket-dumping device is stepped up the tower to stay ahead of the form. When the slip-form operation is complete, the tower still serves to raise concrete and other materials to the roof deck and to provide a means of access for the workmen.

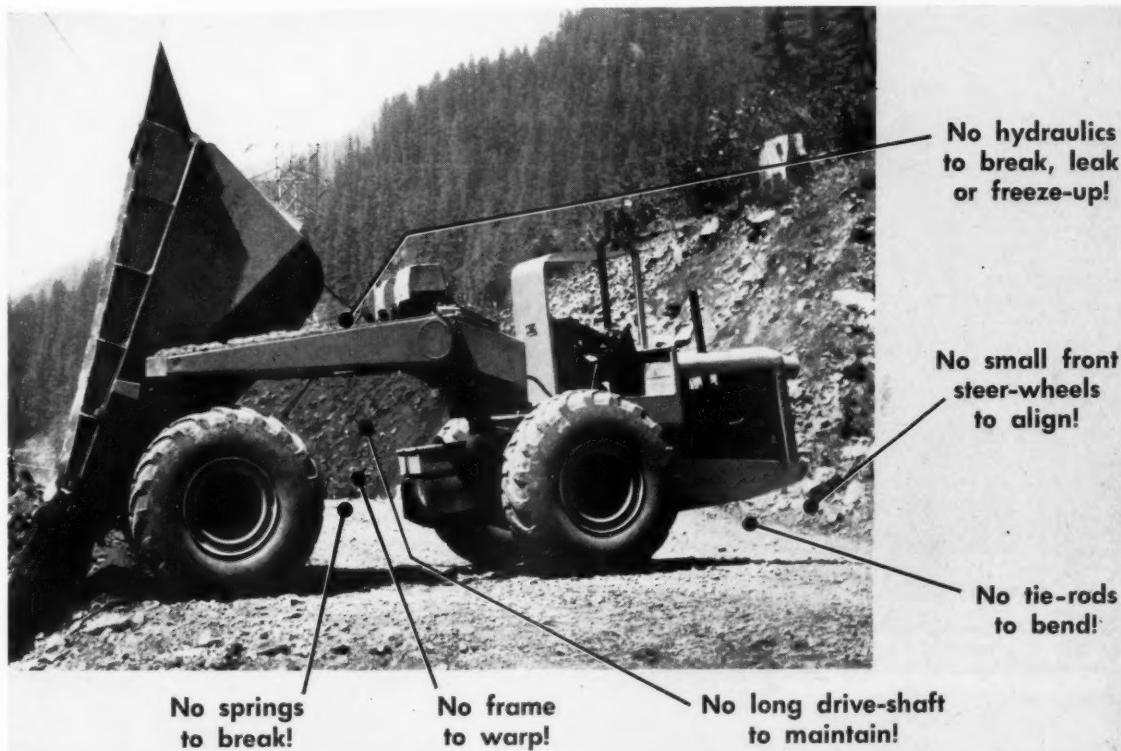
Ready-mix concrete is delivered

in transit-mixers that back up an earth ramp and dump into the tower hopper. The bucket, operated by a two-drum electric-powered Thomas hoist, raises the concrete and chutes it into the hopper on the deck of the form. Hand-powered buggies are filled at the double gates at the bottom of this hopper and wheeled to the point of placement on the form.

The workmen start filling the form at a predetermined place and work across the deck in a uniform pattern, placing about a six-inch lift of

concrete as they go. The crew placing the reinforcing steel follows in the same pattern, placing the reinforcing with each lift of concrete. When the concrete placing crew completed one course, it went back to the original starting point and repeated the operation. As concrete is placed, it is vibrated only a little while with a small Wyco electric vibrator.

The initial filling of the form usually requires three to four hours. The jacking operations then start, and



Cuts your hauling costs!

Tournapull Rear-Dump overcomes most maintenance problems of conventional haulers

Construction of Tournapull Rear-Dump is radically different (and much simpler) than that of a conventional heavy-duty hauler. In place of a foundation frame and body sub-frame, Tournapull Rear-Dump hitch rear and front wheels through a horizontal yoke extending back from the kingpin, and pivoted to body itself just above and ahead of rear wheels. Body is simpler, much stronger...has no frame and sub-frame to get out of line.

are spring maintenance, replacement time, and cost of spring parts.

Front-wheel drive and kingpin-type power steer helps simplify Tournapull construction, too. No longer must power be carried back to the rear through a drive-shaft. Bearing and lubricating problems of a long drive-shaft are eliminated. No longer is steering handled by small front wheels subject to "bulldozing" and misalignment. There are no tie rods, no hinged steering connections to become twisted or bent.

Nor do you have the troubles of hydraulic hoists or gravity dumping with these Rear-Dumps. Dump is by an electric winch, that lifts the body up on

twin cables. Operation is under complete control at all times—with positive power for dump and return controlled by an electric switch on the dash. There are no oil seals, hydraulic pumps...no high-pressure lines and jacks to keep tight...no freezing up in cold weather as with hydraulics. There are no shock loads as in gravity dumping. You save on regular maintenance time because there is no hoist mechanism to check...only a few places to inspect and lubricate.

Let us show you how these savings can put money in your pocket. For proof, we'll be glad to show you performance figures from a job like yours. Or, if you wish, we'll give you names and addresses of nearby owners of Tournapull Rear-Dumps, so you can check the facts for yourself.

Model D—11 tons, 138 hp

Model C—22 tons, 208 hp

Model B—35 tons, 293 hp

Now available with optional tailgate. Prime-mover also powers interchangeable scraper, bottom-dump, flat-bed, crane, logging arch.

Tournapull—Trademark Reg. U.S. Pat. Off. R-1171-G-B

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
Where Quality is a Habit

For more facts, use Reader-Reply Card opposite page 18 and circle No. 254

the form rises continuously at a rate of about 20 feet per 24 hours until the unit is complete. One of the complete slip-form sections requires about 7,000 cubic yards of concrete. This is placed at a rate of about 1,000 cubic yards per 24-hour day. Some days during the job, when concrete was also being placed in the base slabs, the total volume of concrete placed in a 24-hour period exceeded 1,800 cubic yards.

When the slip form reaches the top, it is left in place to form the deck for the 5-inch concrete roof

slab. Concrete for the roof is hoisted in the tower bucket and placed in a manner very similar to that used during slip-form operations. A structural steel cupola is being built on the top of each set of bins to house the horizontal conveyor system.

The \$11.6-million facility, containing 100,000 cubic yards of concrete, is slated to be finished in another two months—just a year and a half from the start of work. Other facilities completed during the initial phase of work on the project are the transit sheds—one measuring 1,440×

120 feet, and two measuring 600×120 feet—together with a 1,000×200-foot back-up warehouse.

Personnel

James Stewart Corp. split the job into two units, each with its own supervisory staff. Equipment, materials, and working crews are switched back and forth between the units to expedite construction. Supervising the No. 1 unit are superintendent Dale Long and assistant superintendents F. E. McLaughlin and W. J. McDonald. The No. 2 unit has super-

intendent Leonard Bockhoven and assistant superintendents Max Harsch and Lloyd Hanks. The president of the James Stewart Corp. is F. R. St. Lawrence.

Representing the consulting engineers, DeLeuw, Cather & Co., as project manager is Walter L. Lane. The chief engineer of the Chicago Regional Port District is J. J. Pisco.

THE END

Hand portable arc welder has output of 200 amps

■ A hand portable arc welder with a 200-amp output is available from Brennen, Bucci & Weber, Inc. The Model 200B is fan-cooled for production use and is equipped with a thermal overload switch to prevent transformer burnout.



The Model 200B hand portable arc welder has a transformer that enables it to do the work of a conventional arc welder several times its size and three times its weight.

The welder employs a new ultra-high-efficiency Transoidal transformer enabling it to perform the work of a conventional arc welder four or five times its size and three times its weight, the manufacturer reports. The model 200B will weld steel 1½ inches thick and will cut steel ¼-inch thick. Its overall dimensions are 12 × 13 × 14 inches.

For further information write to Brennen, Bucci & Weber, Inc., 262 Mott St., New York 12, N. Y., or use the Request Card at page 18. Circle No. 32.

Engine specification sheet

■ A specification sheet giving power curves, design details, engineering features, and installation drawings for the new high-torque heavy-duty Jeep-6 engine is available from Willys Motors, Inc. The engine features positive valve rotators with hard-faced Stellite or Eatonite valves, stellite valve inserts, four-ring aluminum-alloy pistons with hard-chrome compression ring and hard-chrome steel-rail oil ring, a forged crankshaft 100 per cent counterweighted, and single carburetion and manifolding for extra fuel efficiency.

At 2,600 rpm the Jeep-6 is rated at 82 maximum brake horsepower and 65 maximum continuous-duty brake horsepower. The 6-cylinder unit has a compression ratio of 6.86 to 1, a 3.312 bore, and a 4.375 stroke.

To obtain this specification sheet write to Willys Motors, Inc., Industrial Engine Dept., 1505 N. Clove Blvd., Toledo, Ohio, or use the Request Card at page 18. Circle No. 5.

CONTRACTORS AND ENGINEERS

Hydraulic booster power steering
... adjustable wheel height

Adjustable seat rolls forward for sit-down operation, back for stand-up operation

Foot throttle overrides hand setting up or down, leaves both hands free for controls

Low control panel . . . tapered platform for maximum visibility

ALLIS-CHALMERS

FORTY FIVE

FIVE WAYS YOU CAN BOOST GRADER PRODUCTION

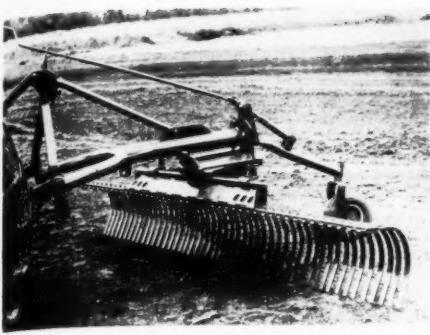
... through operator comfort and control!

Features like these make satisfied operators . . . mean more production for you. They're yours in an Allis-Chalmers FORTY FIVE—120 brake hp, 23,800 lb. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

For more facts, use Reader-Reply Card opposite page 18 and circle No. 255



The Arps rake attachment for the company's utility blade frame can be angled to the left or right.

Angling rake attachment measures eight feet wide

A new rake attachment that fits the Arps utility blade frame is announced by the Arps Corp. The rake is attached in minutes by removing two nuts and one pin and sliding the tool into place.

Built with closely spaced tines, the rake is 8 feet wide. It may be angled either to the left or right in any one of eight positions. In an angled position, the rake will discharge material in a windrow; in a normal position, it can be used for grading, leveling, and mulching soil.

An optional gage wheel is readily adjusted to maintain consistent depth penetration for land-leveling operations. It can be detached when not required.

For further information write to the Arps Corp., New Holstein, Wis., or use the Request Card at page 18. Circle No. 76.

Two-lever-arm clamshells

A catalog from the Jos. F. Kiesler Co. describes the firm's line of two-lever-arm clamshell buckets which operate with power applied to both shells. Included are complete specifications for all models, sizes, and types of clamshell, dredging, and rehandling buckets.

A section is devoted to the construction features of the Kiesler line. Four steps to follow in the selection of the proper bucket in accordance with the crane to be used, the material to be handled, and the job to be done are listed and explained. A parts list showing the code number, description, and amount required for all parts of all types and sizes of buckets is shown in chart form.

To obtain the catalog write to the Jos. F. Kiesler Co., 928-942 W. Huron St., Chicago 22, Ill., or use the Request Card that is bound in at page 18. Circle No. 6.

SAME nominates officers

The Society of American Military Engineers has nominated Rear Adm. H. Arnold Karo and Maj. Gen. Emerson C. Itschner president and first vice president, respectively, for terms beginning in May of this year. Adm. Karo is the director of the U. S. Coast and Geodetic Survey. Gen. Itschner is the chief of engineers of the U. S. Army Corps of Engineers.

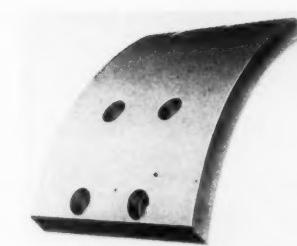
Ten other officers have also been nominated for directors of the society.

For more facts, circle No. 256.

All-metal brake blocks

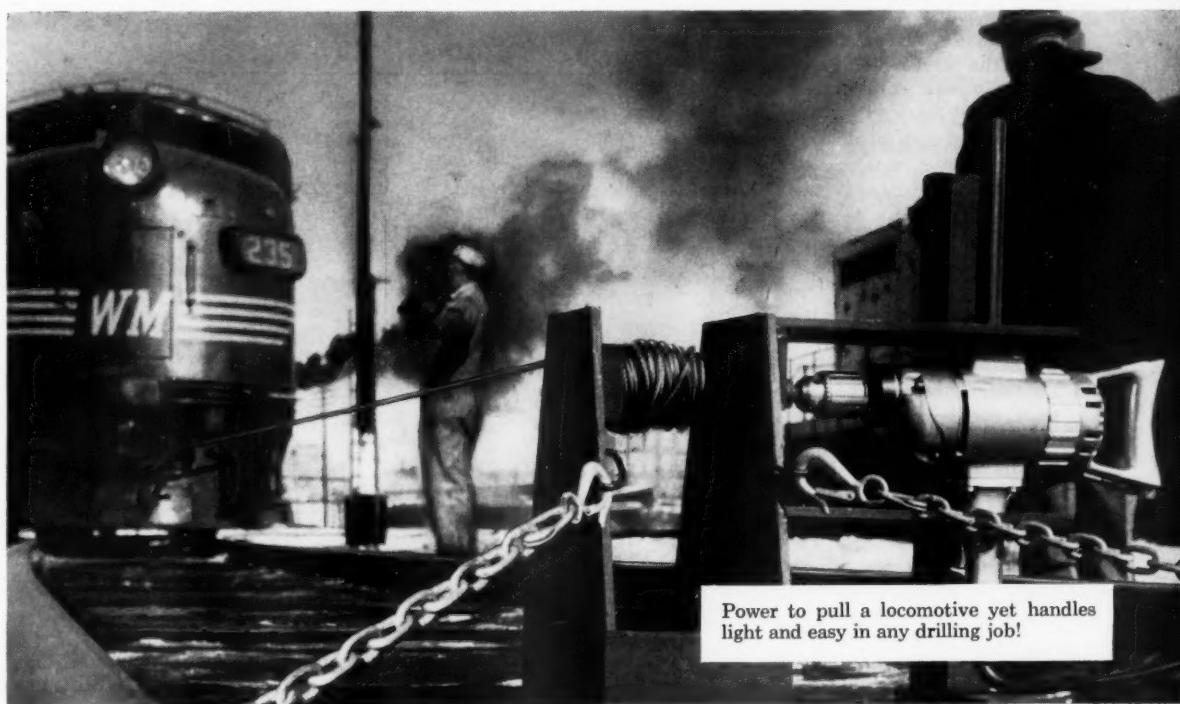
A new line of all-metal brake blocks, reported to last four times longer than non-metal linings under the severest conditions, is available from the S. K. Wellman Co. The brake blocks are recommended for use on heavy-duty equipment.

Made from powdered ferrous metals and various wear-controlling refractory elements, the brake blocks show no fade on high-speed stops or continuous downhill braking under loads, the company reports. Also, they are not affected by moisture or grease, require fewer adjustments,



and increase drum life up to 600 per cent, according to the manufacturer.

For further information write to the S. K. Wellman Co., 200 Egbert Road, Bedford, Ohio, or use the Request Card at page 18. Circle No. 81.



Power to pull a locomotive yet handles light and easy in any drilling job!

New B&D Heavy-Duty Drills ... obsolete any drills you've ever tried

Full-power reversible feature built in at no extra cost!

Now, Black & Decker brings you the world's most powerful drills, built to a new design concept that obsoletes all other drills of similar rated capacity.

Brilliant, new B&D-built motors give them twice the power of their predecessors. They have full power in either direction. New positive key-drive chuck can't come off when tool is reversed—yet is disassembled in seconds. New, longer handles give you easy control even at maximum torque!

And these new tools are versatile! Their tremendous power makes it possible to use them as power units for construction elevators, speed reducers, chain and winch hoists and scores of other applications! Available in $\frac{1}{2}$ ", $\frac{3}{8}$ " and $\frac{1}{4}$ " models. Ask your nearby B&D distributor for a demonstration. Or write for complete details to: THE BLACK & DECKER MFG. CO., Dept. 1304, Towson 4, Md. (In Canada: 80-86 Fleet St., E., Toronto 2, Ont.)

Leading Distributors Everywhere Sell



Black & Decker®

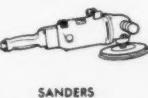
Portable Electric Tools—Power-built to set the pace



SCREW DRIVERS



IMPACT WRENCHES



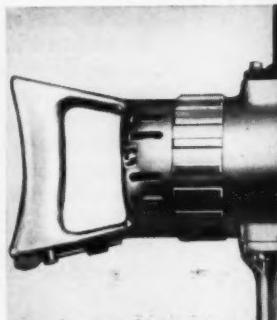
SANDERS



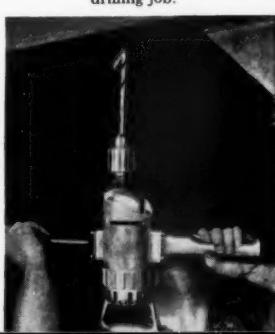
SHEARS & NIBBLERS



NEW HI-TORQUE MOTOR holds speed under load. No need to go to bigger, heavier drills.



NEW REVERSIBLE FEATURE built-in at no extra cost for full power in either direction.



BALANCED DESIGN makes these power-packed tools easy to handle in any drilling job.



DRIVING A BIG AUGER is a fast job for powerful, new B&D Heavy-Duty Drills.



Tree stump remover grinds stump away

■ A one-man-operated machine that solves the problems of tree stump removal and stump disposal by grinding the stump down to as much as 14 inches below ground level is available from The Exeter Co. The Stump Hewer consists of a cutting head fitted with heat-treated tool steel blades swinging on an adjustable arm fixed to a center post.

The head is operated by an electric motor powered by a generator. The entire unit is mounted on a mobile rubber-tired trailer that can be towed at road speeds by auto or truck. Adjustable jack supports keep the entire unit stable.

Wheelbarrow-type handles guide the cutting head into the stump. The head can be rotated 360 degrees through an 8-foot radius without moving the trailer. The head is adjustable to cut from 12 inches above to 14 inches below ground level. The generator develops 2,500 watts and can be used to power other electric tools.

For further information write to The Exeter Co., P. O. Box 511, Bloomfield, N. J., or use the Request Card at page 18. Circle No. 78.

Screed and vibrator

■ A twin-beam vibrating screed that is recommended for striking off and smoothing prestressed slabs or pavements, and a concrete vibrator with a 1½-inch vibrating head are the subjects of a new bulletin from the Stow Mfg. Co. Vibration in the screed is transmitted evenly to both beams, producing the equivalent of two passes, one right after the other. The small head of the concrete vibrator is said to make it ideal for use in pre-stressed forms.

To obtain Bulletin 5616 write to the Stow Mfg. Co., 443 State St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 13.

Power tool catalog

■ Skil Corp.'s 1957 catalog of portable power tools is now available from the company. Construction tools are grouped in the first part of the catalog. Specifications at the bottom of each page permit easy selection of the tools required. Accessories for all tools are also included. The catalog includes 10 new additions to the Skil line.

To obtain this catalog write to the Skil Corp., 5033 Elston Ave., Chicago 30, Ill., or use the Request Card at page 18. Circle No. 7.

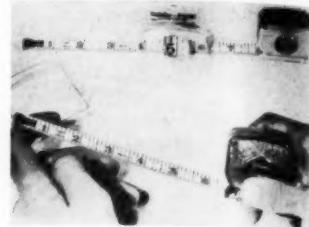
The Stump Hewer grinds away tree stumps down to as much as 14 inches below ground level.

Measuring tape features controlled-speed rewind

■ A pocket-size steel tape designed with a ½-inch blade that can be automatically returned to its case under controlled speed is available from the Evans Rule Co. The tape is rewound by pushing a button on the side of the case.

The user need not worry about the blade of the Power-Tape whip-lashing as it rewinds because of the positive control he has over the speed of the tape return. The internal control mechanism is made of molded nylon.

The Power-Tape is available in 6, 8, 10, and 12-foot lengths. All sizes have a self-adjusting end hook that automatically compensates for its own thickness when taking inside



and outside measurements. The new tape takes the same replacement blade as regular Evans White Tapes.

For further information write to the Evans Rule Co., 400-416 Trumbull St., Elizabeth, N. J., or use the Request Card at page 18. Circle No. 35.

Here are 9 top MONEY-MAKERS on today's top building jobs

**The country over, these
Blue Chip GMC's are outperforming
—and out-earning—other trucks in
29,000 GVW-90,000 GCW work**

ONE REASON's their power. These GMC's are typical of a complete line offering a choice of the most advanced V8's—the thriftest Sixes—the truck world's only Turbopower 2-cycle Diesel.

That's harnessed to extra-stamina-engineered chassis—in a range of wheelbase lengths for every possible need. Each one's

available with factory-installed, L-type or full-channel reinforcements—if needed for extra-severe service.

And all axles—front and rear—are oversize. There's a selection of rugged transmissions. Safety Power Steering* is available on every model. **And many of them now offer GMC's new front engine PTO* for transit-mix work.**

Add it all up and it's easy to see what's making these GMC Money-Makers the hands-down choice of more and more truck-users. For the full story on any one of them, see your GMC dealer!

*Optional at extra cost

GMC TRUCK & COACH—A General Motors Division



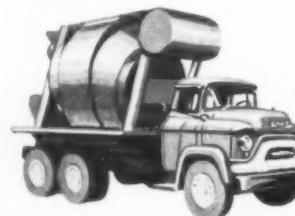
SERIES W500 Tandem Money-Makers
—206-h.p. V8 engine, 32,000 lbs. GVW—
55,000 lbs. GCW. Axles: 7,000 lbs. front;
28,000 lbs. tandem rear. Three wheel-
bases 158"-194".



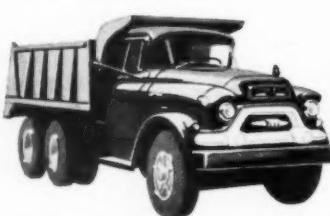
SERIES W550 Tandem Money-Makers
—232-h.p. V8 engine, 40,000 lbs. GVW—
60,000 lbs. GCW. Axles: 9,000 lbs.
front; 34,000 lbs. tandem rear. Four
wheelbases 146"-194".



SERIES 630A Money-Makers—220-h.p.
Six, 29,000 lbs. GVW—55,000 lbs. GCW.
Axles: 9,000 lbs. front; 21,000 lbs. rear.
Five wheelbases 141"-201".



SERIES FW550 Tandem Money-Makers
—232-h.p. V8 engine, 89" cab, 42,000
lbs. GVW—60,000 lbs. GCW. Axles:
9,000 lbs. front; 34,000 lbs. tandem rear.
Five wheelbases 139"-175".



SERIES W630 Tandem Money-Makers
—220-h.p. Six, 42,000 lbs. GVW—65,000
lbs. GCW. Axles: 9,000 lbs. front;
34,000 lbs. tandem rear. Four wheel-
bases 153"-201".



SERIES 660 Money-Makers—220-h.p.
Six, 30,000 lbs. GVW—65,000 lbs. GCW.
Axles: 9,000 lbs. front; 22,000 lbs. rear.
Three wheelbases 141"-165".



The Agricat loader is equipped with a hydraulically operated bucket tilt mechanism and a 6-cubic-foot bucket.

Improved crawler-loader has hydraulic bucket tilt

■ An improved crawler-loader with a hydraulically operated bucket tilt mechanism is available from the Joost Mfg. Co. Designated the Model F Agricat, the machine can be converted into a light-duty earthmover in 10 minutes by replacing the bucket with a blade, the company reports.

For loading operations, the bucket tilt permits complete control of spillage. It can also be used for breaking and loosening hard-packed soil after the bucket ripper teeth have penetrated. The bucket capacity is 6 cubic feet.

Both the lift and tilt mechanisms are powered by a vane-type 1,000-psi pump. The Agricat bucket can load

to a maximum height of 87 inches, and can descend 5 inches below track level. A hydraulic drawbar and scarifier are available optionally.

Converted into an earthmover, the hydraulic tilt mechanism permits blade pitch adjustment from 25 degrees suction of blade to a horizontal position. The blade is 16 inches high and 48 inches wide. It is equipped with a $\frac{1}{2} \times 4$ -inch cutter bar for heavy-duty service, and may also be equipped with side plates.

For further information write to the Joost Mfg. Co., 742 Bancroft Way, Berkeley 10, Calif., or use the Request Card that is bound in at page 18. Circle No. 49.



SERIES W660 Tandem Money-Makers
—220-h.p. Six. 46,000 lbs. GVW—70,000 lbs. GCW. Axles: 11,000 lbs. front; 36,000 lbs. tandem rear. Four wheelbases 165"-201".



SERIES W670 Tandem Money-Makers
—220-h.p. Six. 59,000 lbs. GVW—90,000 lbs. GCW. Axles: 11,000 lbs. front; 48,000 lbs. tandem rear. Three wheelbases 177"-191".



SERIES D930 Diesel Money-Makers
—236-h.p. Turbopower Diesel. 33,000 lbs. GVW—70,000 lbs. GCW. Axles: 11,000 lbs. front; 22,000 lbs. rear. Two wheelbases 152"-164".

For more facts, use Reader-Reply Card opposite page 18 and circle No. 257

Looseleaf design manual

■ An 80-page design manual containing all related specifications, data, and detailed drawings for complete roof and floor systems, curtain wall back-up, and other buildings sections is available from the Perlite Institute. When properly used, the Perlite design manual will save many hours of design and specification time on jobs using perlite insulating concrete or perlite-gypsum plaster, the Institute states.

Bound in a loose-leaf notebook, the manual includes data required for designing and specifying the various components of a complete building section without restricting the architect or engineer's freedom to make special adaptations. There is a minimum need for cross-reference since design data and specifications for each system or building component are complete in a single detachable unit.

Additional copies of each of the 18 different specification and data sheets are available for use by architects and engineers' representatives on the construction site, and for distribution to contractors preparing bids.

Charts and tables eliminate the need for computing U factors, dead loads, and load-carrying capacity data for many types of construction. Guide specifications are prepared in both a short and long form so that the specifier need only fill the blanks to prescribe physical properties of all materials involved.

To obtain this manual write to the Perlite Institute, 45 W. 45th St., New York 36, N. Y., or use the Request Card at page 18. Circle No. 2.

Outboard motors

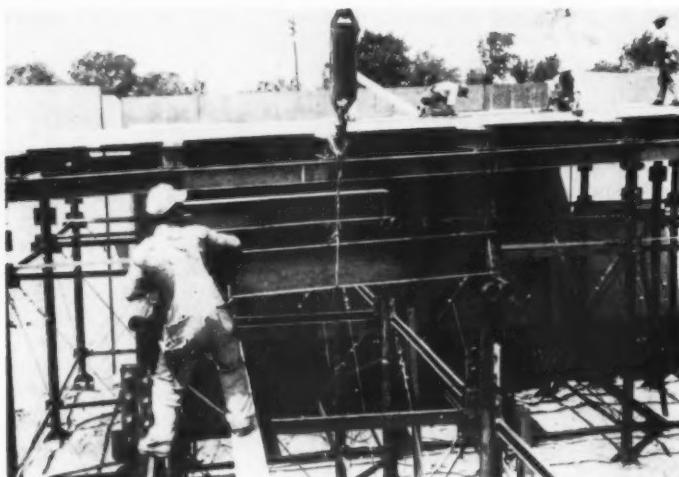
■ The Utility Series of Harbormaster outboard propulsion and steering units for powering dredging barges is detailed in a bulletin from Murray & Tregurtha, Inc. In addition to a complete description of the gasoline and diesel-powered 40 to 60-hp units, specifications are shown. Four different models are available.

To obtain this bulletin write to Murray & Tregurtha, Inc., 80 Hancock St., Quincy 71, Mass., or use the Request Card at page 18. Circle No. 10.



Steel falsework system for bridges b

Herman Deavers, left, superintendent of Austin Bridge Co., and C. Z. Woodworth, bridge inspector for the Oklahoma State Highway Department, demonstrate the working of the adjustable telescoping column section of the falsework.



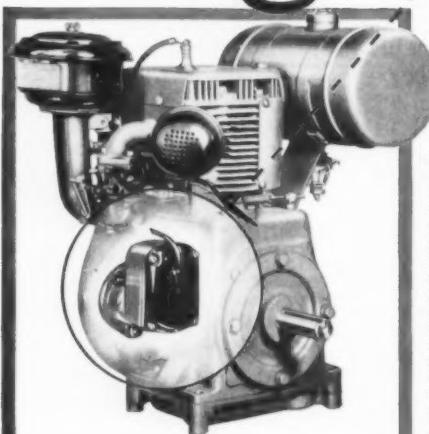
Once columns have been set and the telescoping sections adjusted to grade, a crane sets the 12-inch H-sections that serve as caps. The short stubs of pipe on the tops of the columns provide point bearing for the caps.

A steel falsework system for forming grade-separation structures, designed to save erection time and to cut costs by many re-uses, fared well during tests on a project at Oklahoma City.

The first use of the system was on one of the bridges of the 23rd Street rotary on the East Bypass, which carries U. S. 66 and 77 around the eastern edge of the Oklahoma capital city. Construction of the new bypass route was planned and supervised by the Oklahoma State Highway Department.

The two-span rigid-frame structure

SELF-CONTAINED Magneto



...another reason why
**WISCONSIN
ENGINES** rank
1st in the world, 3 to 56 hp.

The finest ignition system ever developed for air-cooled engines, 3 to 56 hp. . . . and here's why!

Each Wisconsin Engine magneto is entirely self-contained, mounts OUTSIDE the engine, and is accessible for service by simply removing two bolts. No need to disassemble the engine when servicing. Also, each magneto is gear-driven, tightly sealed against dust and moisture and impulse-coupled for a quick, hot spark and easy starting in any weather, any climate . . . a heavy-duty industrial type magneto of the type usually found only on much larger engines.

The magneto is another good reason why you should specify Wisconsin Engines for your equipment . . . and gain more service, do less servicing.

Write for handy service map S-198 pinpointing locations of more than 2000 authorized service stations ready to serve you.

**WISCONSIN MOTOR
CORPORATION**
MILWAUKEE 46, WISCONSIN
World's Largest Builders of
Heavy-Duty Air-Cooled Engines



Better Performance Depends on Better Features....

For more facts, use Reader-Reply Card opposite page 18 and circle No. 258



DANGER
This man doesn't realize he is in danger. But he is. Just look at the old-fashioned shoulder coil of tie wire. It's heavy and clumsy . . . can easily catch on protruding objects . . . must be removed to do other work . . . and, if he picks it up again, the wire ends can scratch his neck or back, or injure his eyes.

SAFETY
WITH
CAL-TIE® WIRE
in the handy
reel dispenser

This man is safe. He's using Cal-Tie Wire in the handy reel dispenser. It's light in weight, and there's no clumsy coil to catch on protruding objects . . . no wire ends which endanger his eyes . . . no chance of infections from scratches . . . no lost time accident. No wonder so many contractors are switching to this modern way of tying re-bars. Why don't you investigate Cal-Tie Wire in the handy reel dispenser today?



CAL-TIE WIRE
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver
El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo
Salt Lake City • San Francisco • Seattle • Spokane • Wichita
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CANADIAN OFFICES AT: Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Reader-Reply Card opposite page 18 and circle No. 259

CONTRACTORS AND ENGINEERS

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APRIL

Bridges both erection time and cost

Ingenious telescoping columns can be adjusted precisely; system facilitates lowering of forms for stripping



A column is set in place on a mud sill. The 6-inch pipe columns of the falsework are spaced at 7-foot centers in both directions to support the forms for the concrete.

on which the falsework was tested is one of seven bridges on this section of the bypass for which Austin Bridge Co., Dallas, Texas, contracted.

The selection of this particular structure proved a real test of the new system's flexibility, since work on this bridge was a little complicated. The span was on a horizontal curve, requiring superelevation, and it had a vertical curve and skewed abutments.

In this first test, one span of the two-span bridge was formed with conventional timber falsework, while the second span was formed with the

new steel system. This made it possible to compare erection and stripping costs and provided a basis for computing comparative material costs.

Telescoping columns

Six-inch pipe columns spaced at 7-foot centers in both directions form the principal support for the forms. An ingenious telescoping insert in the top of each of the columns provides for adjustment of the form to exact grade at each column. A patent application has already been filed for the mechanism.

On the top of the telescoping sleeve is welded a bearing plate and two 14-inch pieces of 4-inch pipe that serve as bearings for the steel caps spanning between the columns.

On this job, Austin Bridge Co. first set timber mud sills in the ground for bearing. A Lorain K-50 crane picked up the columns and set them in place on the mud sills. Angle braces and cable ties with turnbuckles were connected between the columns to make them plumb and give the falsework rigidity. Sections of 12-inch H-piles, 7 feet long were then set on

(Continued on next page)

ROCKFORD Double Plate Clutch Provides More Torque



- With Less Size

Used in a large crawler-type tractor, this Double-Plate ROCKFORD Morlife CLUTCH (Utilizing two MORLIFE® plates—equipped with button type facings) provides 100% more torque capacity than previous clutches of same diameter. 400% more service life and 50% more heat resistance are other features of this Heavy-Duty ROCKFORD Morlife CLUTCH. A brake plate is mounted on the heavy-duty, ball bearing type release sleeve.

If you have a heavy-duty vehicle in the planning stage, it will pay you to learn about these and other advantages of this new clutch—before you design the drive line. A design study of your present drive lines might indicate advantages of using this ROCKFORD CLUTCH. For information write Dept. D—or

SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER

314 Catherine St., Rockford, Ill., U.S.A.
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.



PRIME-MOVER M15A FOR BUILDING CONSTRUCTION Places 12 to 17 cu. yds. of concrete per hour on school, hospital and commercial projects—without extensive preparations for its use. Runs on same type of ramps, hoists and runways as hand carts. Available with flatbed, or 10 cu. ft. bucket.

M15A

PRIME-MOVER

M30

FOR HIGH VOLUME, LOW COST
PLACING OF CONCRETE AND
OTHER BULK MATERIALS—
USE PRIME-MOVER POWER!



PRIME-MOVER M30 FOR ENGINEERED CONSTRUCTION

Hauls $\frac{2}{3}$ yard or 1-1/2 tons. Unloads transit mixers fast. Spots concrete right where it's needed on plant, warehouse, pier and bridge construction. Hydraulic Torque Converter Drive frees the operator from shifting, clutching and wasted effort. Rugged, dependable. Bucket and flat bed.

FOR COMPLETE DETAILS WRITE TO PRIME-MOVER CO., MUSCATINE, IOWA
For more facts, use Reader-Reply Card opposite page 18 and circle No. 261

Cables, used to plumb and brace the falsework, are looped and fastened with Tiger and Crosby cable clips. The workman uses a Thor electric impact wrench powered by an Onan generator for the job.



(Continued from preceding page)

the bearing pipes on the tops of the columns to serve as caps. Stringers, also made of 7-foot sections of H-piles, were placed on the caps in the opposite direction to complete the steel portion of the form.

The timber deck was constructed with 2×6 joists at 12-inch centers, together with 3/4-inch plywood decking. A few nails—required to hold the decking together—were the only nails in the entire form. The form, erected very quickly, was extremely strong and rigid. After the concrete had been placed and cured, the falsework was quickly and easily removed, and there was no loss of material.

The timber falsework in the adjacent bay consisted of 12×12 posts and caps with 6×12 stringers spaced 8 feet apart. The floor was made up of 2×10 joists at 10-inch centers and 3/4-inch plywood decking. The falsework was cross-braced in both directions with 2×8 and 3×10 bracing.

Concrete piers and abutments

Spread footings for the pier and abutments of the bridge were built in holes excavated by the Lorain K-50 crane with a Page 1 1/4-yard clamshell bucket. The footing excavations were trimmed by hand so that the concrete could be placed directly from transit-mix trucks and the need for footing forms eliminated.

Piers, abutments, and retaining walls were formed with prefabricated form panels consisting of 3/4-inch plywood sheathing backed with 2×4 studs and wales. The panels were set by the crane and were tied with Dayton form hardware. Concrete in these sections was placed by the crane using a Heltzel 1 1/2-yard bottom-dump concrete bucket. An Ingersoll-Rand air-powered vibrator powered by a Gardner-Denver 210-cfm compressor was used to consolidate the concrete in these forms. On some of the small pours, a Viber electric vibrator powered by an Onan 3-kw generator was used.

The concrete deck of the bridge contained a 30-foot roadway with a 5-foot sidewalk on one side and a 2.5-foot curb on the other side. A steel railing was supported on cast-in-place concrete posts.

This bridge contained 862 cubic yards of concrete and 98,460 pounds

One of the falsework columns is set by a Lorain K-50 crane. Concrete will be placed in the forms by the crane, which will hoist the material in buckets directly from transit-mix trucks to the deck.



GIVE OUTPUT AND PROFITS A JET-ASSIST LIFT **Marionair** CONTROL

USED ON ALL DIESEL POWERED MARION MACHINES

The hardest working air in the world passes through Marionair Controls. It knocks the wind out of the toughest jobs—and finishes most of them in a breeze. It's like harnessing a hurricane . . . taming a tornado . . . turning their energy into job profits.

Why Air Control—Air is safe: no shock or fire hazard. Air is simple, without costly and complicated linkage. No return lines needed. Operating men understand it easily.

Why MARIONAIR Control—Marion went all the way with air control as early as 1940; Marion has devoted 16 years to its refinement and perfection. Marion has the world's broadest line of air controlled excavators and cranes. Marion makes air do more.

Easy Does It—Marionair Control gradually and smoothly exerts from 0 to 90 or more pounds of pressure on the clutches, in direct proportion to hand pressures on the controls. It is easy to use, easy to service.

Efficiency Goes Up—Operators remain fresh and alert all shift long because Marionair Control virtually eliminates operator fatigue. "Feel of the load" is retained, helping the operator to work confidently and efficiently.

Easier Maintenance—Its simplicity means fewer maintenance problems. No rods, levers and pin connections to become loose with wear.

Smooth Performance—A smooth, positive flow of power to the clutches, without jerkiness or delay. No need for a fine sense of timing to put the dipper, bucket or crane load where you want it.

FIELD PROVED FOR 16 YEARS

Marionair Controls have been proved by 16 years on-the-job . . . by all types of service and working conditions. Marionair Control has been integrated into the basic design of machines. Marion has made full use of compensating valves for gradual, smooth engagement of friction clutches . . . poppet valves for jaw clutches and other "on or off" controls. Marionair Control puts full power at the operator's finger tips . . . gives him instant, accurate control of the load. Put Marionair Control's "muscles of air" to work on your jobs. Let a compressor—not your operator—do the huffing and puffing.

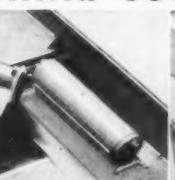
CRANE EXPERTS: HEAR THIS!

When Marionair Control is teamed with big, smooth Marion clutches, a torque converter and a foot accelerator, you are ready for the most ticklish precision crane jobs involving the lightest or heaviest loads. One foot on the accelerator can lift the load, lower it, inch it into position or hold it in one position.

MARIONAIR CONTROL STEP-BY-STEP



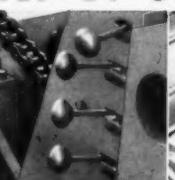
Dependable, kingsize compressor, operated by power unit through V-belt drive, has capacity to maintain full pressure in extremely fast cycles; its operation is automatically controlled.



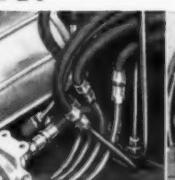
Pressure reservoir tank, in out-of-the-way pocket of upper frame, stabilizes pressure entering the lines; fitted with safety release valve and outlet for use in draining excess condensate.



Compensating valves "meter" air to cylinders or expanding tubes controlling friction clutches. Operator restrains feel of the load, gets smooth, gradual engagement or fast, crisp cycle time.



Poppet valves govern operation of jaw clutches and other "on-or-off" controls. Operator's wrist movement produces instant, positive action. Controls conveniently grouped on panel in cab.



Strong copper tubing and heavy-duty flexible hose carry air pressure to all parts of machine; replace conventional levers, rods and pins. Operators like simplicity and reliability of air.



Marionair Control engages this clutch in direct proportion to the speed and firmness of the operator's hand pressure on control lever. The response is uniform, consistent and dependable every time.

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of reinforcing steel. Austin Bridge Co.'s contract also included the construction of three other bridges and some retaining walls. The total contract price was \$367,638.70. The four structures required a total of 5,710 cubic yards of concrete and 678,420 pounds of reinforcing steel.

Personnel

Supervising the project for Austin Bridge Co. was Herman Deavers, superintendent. For the Oklahoma State Highway department, C. Z. Woodworth was bridge inspector and J. M. Copeland, resident engineer.

THE END

April is Cancer Month. This year's theme is "Fight cancer with a check-up and a check."

SISTERLIFT WITH



MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 262

APRIL, 1957



The Stabilift has a capacity of 20 tons and can haul seven 5,500-pound batches of concrete.

Frameless semi-dump hauls seven batches of concrete

■ A frameless semi-dump trailer that can handle seven 5,500-pound batches of concrete is available from the Cook Bros. Equipment Co. The Stabilift, also recommended for hauling hot mixes, has a capacity of 20 tons.

According to the manufacturer, the Stabilift's outstanding stability enables the operator to easily and quickly move the rig in and out of the skip, and discharge each batch while the paving machine operates at full capacity. The rig's stability eliminates the danger of tipping, allowing it to be employed on all types of terrain, the company reports.

For further information write to the Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles, Calif., or use the Request Card at page 18. Circle No. 50.

Equipment lubricants

■ Several folders describing D-A lubricants for use on construction machinery are available from D-A Lubricant Co., Inc. Included among the folders are details on heavy-duty lubricants for shovels, crushers, vibrating screens, and hot-mix plants; and Series 3 diesel oil protect against sticking, acid corrosion, and engine wear. The folders also contain information on gear lubricants for transmissions and final drives; and track roller grease that seals out mud and water, cushions shock loads, and retains its thickness in severe heat.

To obtain these folders write to D-A Lubricant Co., Inc., 1331 W. 29th St., Indianapolis 3, Ind., or use the Request Card at page 18. Circle No. 11.

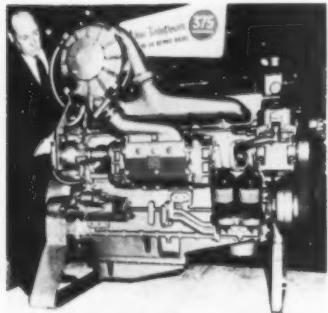
Dipper bucket line

■ A folder describing its line of cast-weld and fabricated dipper buckets is available from the Renner Mfg. Co. Included in the line are cast-weld shovel dippers and fabricated or cast-weld trench hoes.

The shovel dippers are available in $\frac{1}{2}$ and $\frac{3}{4}$ -cubic-yard capacities, with seven models of each. The cast-weld trench hoe is available in $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$ -cubic-yard capacities with six models of each. The fabricated trench hoe has a capacity of $\frac{3}{8}$ cubic yard. All shovels have replaceable teeth.

To obtain this folder write to the Renner Mfg. Co., Box 125, Butler, Wis., or use the card at page 18. Circle No. 4.

Turbocharging increases diesel plant's horsepower



■ A 375-hp diesel for off-highway earthmoving vehicles, scrapers, and other equipment requiring a comparatively small, light-weight unit of high power output has been developed by

the Detroit Diesel Engine Division of the General Motors Corp.

The new engine is a six-cylinder two-cycle Series 110 model in which a 25 per cent gain in horsepower has been attained through turbocharging. The increase in horsepower has been accomplished with no appreciable increase in engine bulk, weight, or fuel consumption. An exhaust-driven turbine driving an air impeller works with the engine blower to increase the fresh air supply to the cylinders.

For further information write to the Detroit Diesel Engine Division, General Motors Corp., 13400 West Outer Drive, Detroit 28, Mich., or use the Request Card at page 18. Circle No. 83.



The new Scoopmobile Model LD20AD 6-cubic-yard front-end loader has a breakout force of 35,000 pounds and a working capacity of 25,000 pounds.

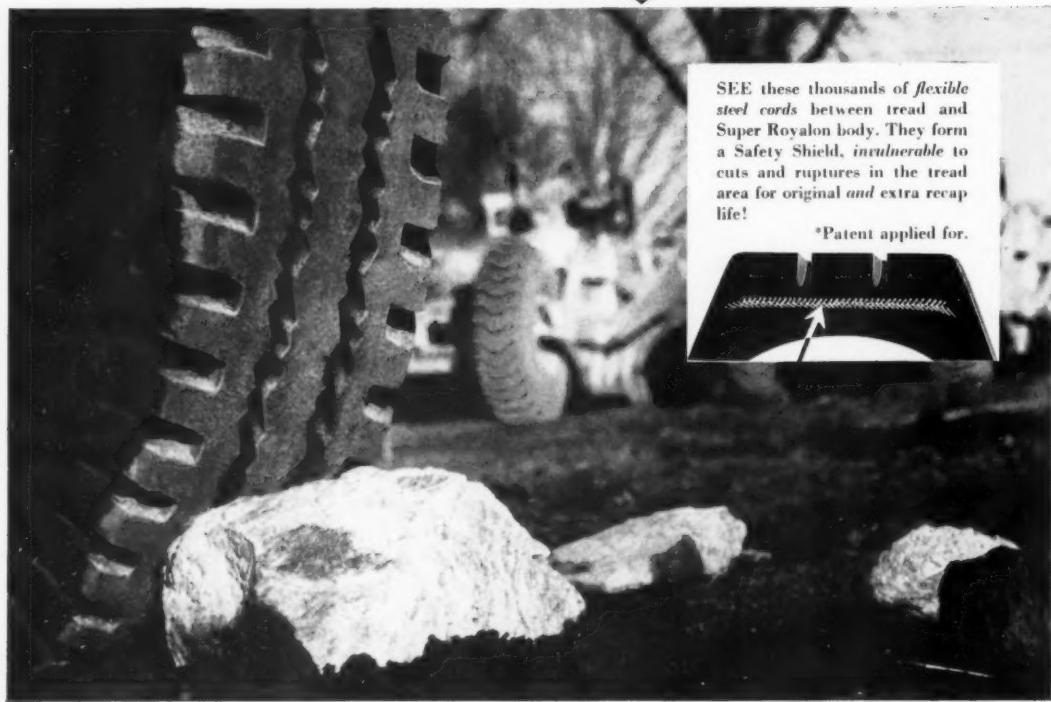
Loader's break-out force is rated at 35,000 pounds

■ A 6-cubic-yard front-end loader with a break-out lifting capacity of 35,000 pounds and a working capacity of 25,000 pounds is available from Mixermobile Manufacturers. The Model LD20AD Scoopmobile is equipped with a torque converter, a power-shift, full-reversing transmission, power steering, four-wheel planetary drive, and a roll-out high-discharge bucket with a variable discharge height.

Also featured in the new Scoopmobile are two-axle oscillation, center-pin coupling, non-rigid frame, interchangeable axles, and lateral bucket spotting.

For further information write to Mixermobile Manufacturers, 8027 N.E. Killingsworth St., Portland, Oreg., or use the Request Card at page 18. Circle No. 77.

Keep the job GOING with exclusive SAFETY STEEL SHIELD*



SEE these thousands of flexible steel cords between tread and Super Royalon body. They form a Safety Shield, invulnerable to cuts and ruptures in the tread area for original and extra recap life!

*Patent applied for.

U. S. ROYAL *Super* *FLEETMASTER*

For graders, scrapers, heavy off-the-road equipment—

U.S.ROYAL

CON-TRAK-TOR
Full Lug



• Triple Impact Protection—added rubber between plies, double shock-pads, extra-tough construction at the crown.

• Full-Lug Traction—massive beefed-up lugs extend from shoulder to shoulder, take hold and pull where others slip and spin!

Don't let tire failure hold up your job. Put your trucks on the new U. S. Royal Super Fleetmaster. Its Safety Steel Shield is so immune to hazards that it runs over jagged rocks, even over razor-sharp axblades without losing a pound of air!

This tire's all-new—with money-saving advances throughout its construction. It's all-wheel—built for every on-and-off-the-road truck exposed to heavy impacts in murderous terrain.

Your U. S. Royal Dealer now has the Super Fleetmaster in sizes through 11.00. Call him today—and specify "Super Fleetmaster" when you buy your new equipment!



United States Rubber

Rockefeller Center, New York 20, N.Y.

See things you never saw before. Visit U.S. Rubber's new Exhibit Hall, Rockefeller Center, N.Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 263

In Canada: Dominion Rubber Co., Ltd.

Gar Wood names manager

K. E. Kiess has been named works manager of Gar Wood Industries, Inc., Findlay Division, Findlay, Ohio. In his new position, Kiess will supervise and coordinate all manufacturing operations at the division's plant, which manufactures truck cranes, power shovels, ditchers, and tractors and roadbuilding equipment.

CONTRACTORS AND ENGINEERS

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The Jiffy-Lift tailgate can lift 600 pounds in 15 seconds. It is electrically operated.

New electric tailgate fits one-ton trucks

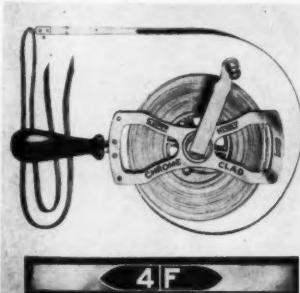
An electric tailgate for $\frac{1}{2}$ and 1-ton trucks that will lift up to 600 pounds in 15 seconds is available from Mid West Body & Mfg. The Jiffy-Lift has a reversible motor and a built-in motor brake to prevent coasting. The heavy-duty push-button control has a built-in lock for security and to assure safe operation.

All moving parts run on ball bearings. The all-steel ramp-type unit weighs 225 pounds and is offered complete, ready for installation.

For further information write to Mid West Body & Mfg., Paris, Ill., or use the Request Card at page 18. Circle No. 31.

Chrome-clad drag tape has raised markings

A new drag tape with raised markings and a raised protective edge around the markings is available from The Lufkin Rule Co. The Super Hi-Way drag tape is furnished in all



4F

The Lufkin chrome-clad Super Hi-Way drag tape has raised markings and a raised protective edge.

standard marking styles in 100, 200, and 300-foot lengths.

The raised markings and protective edge insure that the markings will last longer than the rest of the tape. The markings are chrome white with a jet-black background. The tape has a chrome-clad finish, which is a series of metal electroplatings over a steel line $5/16$ -inch wide.

The final plating is a non-glaring gray-white chrome finish that will not chip, crack, or peel, according to the manufacturer.

For further information write to The Lufkin Rule Co., Saginaw, Mich., or use the Request Card at page 18. Circle No. 26.

Muffler for air hammer cuts noise intensity

A sound-quelling muffler for its Model 25 pavement breaker is available from the Thor Power Tool Co. The Muffle Cover is said to reduce air hammer noise intensity up to 55 per cent.

The Muffle Cover is a thick double jacket of sound-proofing materials that zips around the pavement breaker. It is said to effectively reduce the exhaust noises and the clang of the piston hammer hitting the tappet. The sound of the breaker's steel striking the surface being broken is all that remains, the company states.

For further information write to the Thor Power Tool Co., Aurora, Ill., 30.



or use the Request Card that is bound in at page 18 of this issue. Circle No. 30.

Save Hours with

SHAWNEE® Chief or WARRIOR TRUCK MOUNTED UNIT

Truck is heavy-duty, 4 wheel drive with separate power takeoff to operate hydraulic pump.



- Exclusive "Push-Pull" Power
- Digs 12-15 Feet Deep
- Sold as a Complete Unit or Mounted on Your Truck
- Mounts on Most All Popular Tractors

SHAWNEE

Chief

Bigest of the backhoes—provides tremendous digging force with "push-pull" cylinders operating synchronously. 6 spool control panel enables use of any or all controls at one time. Digs 15 feet deep.

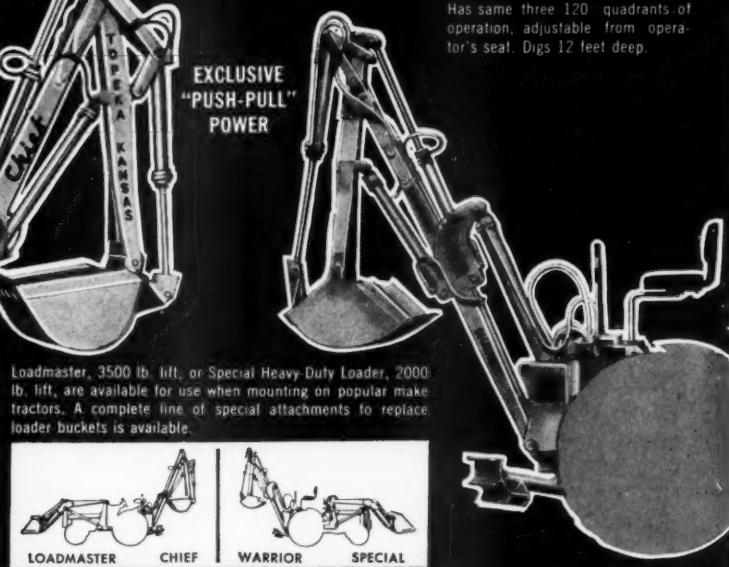


EXCLUSIVE
"PUSH-PULL"
POWER

SHAWNEE

WARRIOR

Slightly smaller version of the Chief. Has same three 120 quadrants of operation, adjustable from operator's seat. Digs 12 feet deep.



Loadmaster, 3500 lb. lift, or Special Heavy-Duty Loader, 2000 lb. lift, are available for use when mounting on popular make tractors. A complete line of special attachments to replace loader buckets is available.



For Additional Information, write

593

**SHAWNEE® MANUFACTURING COMPANY,
incorporated**

1947-M TOPEKA AVENUE • TOPEKA, KANSAS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 264

Light charges protect railroad during highway grading in rock



This rig handles the bulk of the drilling job. Mounted on the Cat D8 are two heavy-duty Joy wagon drills, a Joy rotary air compressor, and Joy booms for horizontal drilling in rock.



A Tournarocker is loaded with the broken rock by a Koehring 605 power shovel. The shovel has an Esco 2½-yard dipper to dig into the hard material.



The operator of this LeTourneau-Westinghouse haul unit uses electrically operated controls to dump rock on one of the fills. Fills were built up in lifts slightly higher than the largest piece of rock they contained.



Working near Flathead River, a Cat D8 with dozer completes a rock ramp to give access to a fill area.

Gravelly or sandy material making up unclassified excavation—about 60 per cent of earthwork—is handled here by a Cat D8 and scraper push-loaded by an International TD-24. ▶

Controlled blasts are made within 4 feet of rail line; shovels dig and load large pieces of rock used as fill

Blasting through massive rock on the same mountain bench used by a Great Northern railway line was one of the most difficult jobs involved in straightening the alignment of U. S. 2 through the south edge of Glacier National Park near Nyak, Mont. Since the contractor had to pay \$2,000 per hour for train delays, he shot the rock formations with light charges of explosives. This made excavation hard on shovels, but it was preferable to risking a block of the railroad tracks.

This contract, held by Tony Mazzacco Co., Boise, Idaho, will come to an estimated cost of practically two million dollars when it is finished next month. This Montana highway grading project—one of the biggest recent jobs—calls for rough grading, construction of two railroad overpasses, two major channel changes in the Flathead River so that bridge crossings are eliminated, a short line change for the railroad, and lowering the elevation of the 5.5-mile stretch so that winter maintenance will be an easier job.

Difficult access

A considerable amount of pioneering was necessary to get crews to the construction area last year. Cat tractors with dozers did yeoman service as they ripped pioneer roads and trails to the river-level site of the

new road, which will take the place of the existing bituminous highway that twists and turns high up against the sheer rock of the mountainside.

Clearing crews followed soon after, using Homelite and McCullough chain saws to fell spruce, pine, fir, and large tamarack trees. Local loggers salvaged the best timber, and the remainder was stacked by the dozers to be burned.

Blasting near railroad

Drilling and shooting was tough. About 40 per cent of the total yardage had to be broken by explosives. One fill near Crystal Creek, almost 125 feet high and 418 feet wide, required 128,530 cubic yards of material. An 80-foot-deep cut in solid rock was located only 100 feet away from the railroad. In some places the native red and green argillite rock and Siyeh limestone lay on edge, sloping dangerously toward the projected roadbed.

Drillers used Joy and Timken tungsten carbide drill bits, which bottomed a 24-foot hole at a 2½-inch diameter without losing gage. This was important, because horizontal holes often had to be drilled for lifter shots made with 2-inch cartridge-type powder. Tungsten carbide bits drilled rapidly in the hard rock, maintaining a smooth, neat hole for the powder. The faster drill-



CONTRACTORS AND ENGINEERS

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ing action of tungsten carbide bits also eliminated congestion by reducing the number of drilling units needed in a given area at one time.

The main drilling rig consisted of a Caterpillar D8 tractor on which a Joy rotary air compressor, Joy booms, and two heavy-duty Joy wagon drills were mounted. This mounting gave the machines a reach 17 feet in radius.

In addition to this highly mobile machine, there were two Joy wagon drills and two Ingersoll-Rand machines, along with a few Jackhammers. Compressor equipment included two Schramm 365-cfm rigs and an Ingersoll-Rand 600-cfm Gyro-Flo machine. Wherever possible, compressed air was sent out to the drill rigs through air receivers and quick-coupled 4-inch delivery pipe. Heavy-duty rubber hose carried air from Christmas trees, at the end of the pipeline, to the drill rigs. The tractor-mounted Joy machine had its own air power mounted on the tractor.

In all rock cuts less than 24 feet deep, steel just long enough to reach 2 inches below the bottom of grade drilled the formation in a single lift. In cuts deeper than 24 feet, 24-foot drill steel removed the material in two or more lifts. The boom-type mounting on the Joy drill was invaluable for the horizontal drilling of lifter holes in the sloping rock formations. A drill hole pattern of 6 feet on centers, with the holes staggered, worked well in most cases, but some individual variation on this drill pattern was required by the various types of formations.

After the holes had been drilled, they were column-loaded with Atlas 2-inch-diameter cartridges of 40 per cent strength, which were tamped in so that they bore against the clean-drilled holes in the rock. Atlas Rockmaster delay caps were used to explode the shots. Delays No. 2 through No. 4 were used during blasting, while No. 6 was used to control the throw of blasts.

The trickiest blasting was that done within 4 feet of the railroad tracks. Here, crews shot the material very lightly and used delays to pile the material away from the track.

Shovels load rock

Rock rolling out in blocky chunks was hard for the shovels to dig loose. But secondary drilling was held to a minimum, for once the rigs started digging, they were able to shake the rock loose and get it loaded.

Three power shovels, including a Koehring Model 605, are using Esco 2½-yard dippers to load the rock to the three LeTourneau-Westinghouse haul units and four Euclid end-dump trucks. These are disposing of the rock in fills. Lifts in all cases are slightly higher than the largest piece of rock being handled, and compac-

tion is achieved by the loaded haul rigs.

Unclassified excavation, consisting of gravelly or sandy material, is being handled by tractors and scrapers. Three Caterpillar D8's with dozers, and two International TD-24's that are being used as pusher-tractors, are working with Caterpillar No. 80 scrapers.

While Marrazzo crews were busy grading, the Spokane, Wash., firm of Hansen & Parr Construction Co.

(Concluded on next page)

This Ingersoll-Rand wagon drill is one of four additional machines putting down blast holes. Using Timken tungsten carbide rock bits, the machine sinks a 2½-inch hole 24 feet deep into the rock.



"THE HARDEST, BLOCKIEST ROCK WE EVER ENCOUNTERED", is how foreman described 805,000 cu. yds. of dense mica schist excavated along a 3.8-mile section of Connecticut Turnpike. Up

to 30,000 lbs. of explosives were used in a week to shoot 30,000 yds. of rock. Thirteen big compressors, 9 of them Jaeger "600's", supported four 2½ yd. shovels.

How Jaeger "600's" sped Turnpike rock job

Excavating in lifts averaging 15', Slattery Contracting Co., Inc., Maspeth, N.Y., worked fast to move 805,000 cu. yds. of hard rock on the Connecticut Turnpike. The largest cut, 58', was taken down in two lifts of 30' and 28'. Drilling was done in three patterns: 8'x8', 7½'x7½' and 6'x6'—a lot of footage. To assure plenty of reserve air for "hurry-up" production, a typical drilling spread teamed two Jaeger "600" Rotaries with three 375 cfm track-mounted drills, providing 400 cfm of 100-lb. air per drill. In other combinations, three Jaeger "600's" powered three and sometimes four 450 cfm track-drills.

Operating at their characteristic slower speed, nine efficient Jaeger "600's" maintained top drilling production for long hours, including double shifts. Full load speed of the Jaeger "600" is only 1650 rpm (100 to 150 rpm slower than other "600" compressors using the same Model 6-71 GM diesel engine), which reduces fuel consumption and engine piston travel and saves up to 9000 compressor revolutions per hour.

Other Jaeger rotaries (125, 250 and 365 cfm) give you this same slow-speed, high-efficiency performance—1700 rpm at full load instead of 1800 to 1950. See your Jaeger distributor, or write for Catalog JCR-5.



JAEGER "365" SPEEDS WORK, TOO: Drives 6 Thor #25 heavy duty breakers with full 100-lb. air wallop to finish job in a hurry at a busy Philadelphia traffic intersection. No "old standard 315" compressor has the capacity to do such a fast job. Putting out 50 cfm more air, the Jaeger "365" operates at a fuel-saving, compressor-saving 1700 rpm at full load—100 rpm slower than any "315" unit.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS
For more facts, use Reader-Reply Card opposite page 18 and circle No. 265

(Continued from preceding page)

built the two short railroad overpasses. Forming for these conventional reinforced-concrete structures consisted of ordinary plywood form facing, 2x4 studs, and Richmond form hardware. Small, portable Kwik-Mix equipment was used to turn out the concrete, which was placed by a Lima crane.

Right now, finishing touches are being put to the job, which the Marrazzo firm has placed under superintendent Pete Kinyon. Future contracts for subbase and surfacing will complete one of the biggest jobs the U. S. Bureau of Public Roads has done under its own auspices in the Pacific Northwest in years.

THE END

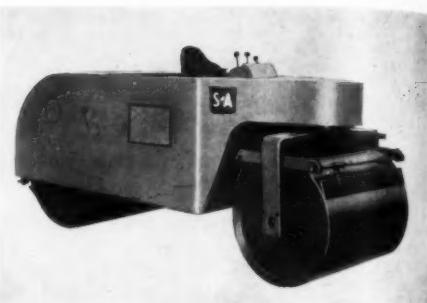
Highway spreader

■ A bulletin describing the new Shunk Torwel reversible automatic highway spreader is available from the company. The spreader can be installed to spread in front of the rear wheels for ice control work, and can be reversed as a single unit for asphalt sanding and other types of material spreading.

The bulletin lists over-all dimensions for the 5, 6, and 7-cubic yard models, and shows the optional equipment that is available. Larger capacity units are available on special order.

To obtain Bulletin 1-57 write to the Shunk Mfg. Co., Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 17.

The Seaman-Andwall 8 to 12-ton tandem steel roller has three forward speeds and three reverse, all controlled by a single lever without clutching.



Rollers' speed, direction regulated by single lever

■ A 5 to 8 and an 8 to 12-ton tandem steel roller, each with three speeds on both forward and reverse, all controlled by a single lever without clutching, are announced by the Seaman-Andwall Corp. The rigs are

powered by 65 and 73-hp gasoline engines, respectively, with diesel engines available optionally.

Hydraulic power steering is said to permit easy handling and to minimize operator fatigue. Provision for water ballast in both the front and rear rollers allows a wide variation of weight adjustment. The over-all design of the rollers is low for improved visibility all around and for greater stability.

For further information write to the Seaman-Andwall Corp., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 41.

BIG Southwest Compaction Equipment for all types of tractors



BIG Southwest Compaction Rollers



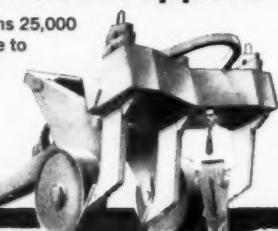
BIG Sheepfoot Rollers



RANGING FROM 5 TO 20 TONS in weight capacity, there are six models of Southwest Rollers featuring full oscillating double drums and two-piece feet with replaceable tips.

BIG Southwest Rippers

IT'S A GIANT that weighs 25,000 lbs. Is built to penetrate to depths of 36", 42" or 48". Special center standard can be furnished to go 60" deep.



BIG Southwest Sprinkler Tanks



Southwest Welding
CONSTRUCTION MACHINERY DIVISION

& MANUFACTURING CO.
ALHAMBRA, CALIFORNIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 266

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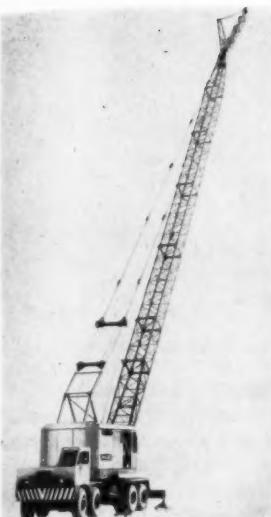
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To obtain Bulletin No. 110 write to E. D. Etnyre & Co., Oregon, Ill., or use the Request Card at page 18. Circle No. 19.



By removing the counterweight, outriggers and floats, the 96,000-pound P&H Model 575-TC truck crane can be reduced to 70,000 pounds, less than 18,000 pounds per axle bearing load.

New truck crane designed for over-the-highway use

A 45-ton truck crane designed specifically for over-the-highway use is announced by the Harnischfeger Corp. The Model 575-TC is said to have more lifting capacity than comparably rated machines because its 45-ton rating is based on a 15-foot radius rather than the standard 12-foot radius.

The 96,000-pound rig has a twin front axle arrangement with hydraulic steering boosters. The counterweight, outriggers, and floats are easily removed to reduce the gross weight of the crane to 70,000 pounds—less than 18,000 pounds per axle bearing load.

Power plants for both crane and carrier are P&H Model 487C diesels, developing 180 horsepower at 1,800 rpm. Drive is to both rear axles with inter-axle differential through a five-speed transmission and three-speed auxiliary transmission. The upper assembly includes such features as a "live" roller circle, triple-safe boom hoist, independent planetary lowering, and smooth-operating hydraulic control, the manufacturer reports.

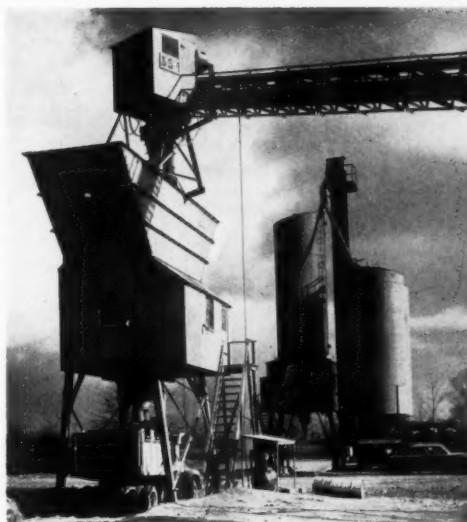
For further information write to the Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 39.

Diamond core drilling

A handbook on diamond core drilling is available from the Joy Mfg. Co. Entitled "Do's and Don'ts for Diamond Core Drilling", the handbook sets forth the basic techniques which apply to all diamond drilling. More than 200 operating tips, ranging from the care of bits to the use of wrenches, are included. In addition, there are sections on diamond bit recommendations for various geological formations and general information about diamonds.

To obtain Bulletin D-38 write to the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 22.

THIS TWO-STOP BLAW-KNOX AGGREGATE AND cement batching plant is said to have averaged 101.5 batches per hour for 23,966 batches last winter without breakdowns or slowdowns on the Mansfield, Ohio, bypass being built by the J. A. Jones Construction Co., Charlotte, N. C. The plant, which consists of a 150-ton three-compartment automatic aggregate unit and an automatic twin-batching cement setup with a 600-barrel overhead bin and a pair of 600-barrel auxiliary bins, has been supplying batches for two 34E dual-drum pavers. This spring, the contractor is running three pavers with the plant. For more details write to the Blaw-Knox Co., 300 Sixth Ave., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 48.



Meet the New OLIVER OC-46



designed exclusively for loader work



The Jet-Trencher, powered by hydraulic loader system, can be mounted or removed in 90 seconds. This great combination can handle many different jobs.

The new Oliver OC-46 offering 5/8-yd. capacity is available only as a complete loader unit. With wide 46" gauge track and greater track length, it gives you the extra stability to use full power at all times. You can work steadily at top speed with the heaping bucket loads that pile up production faster.

Here's extra mobility, too, with 4-speed transmission ranging from 1½ to 5¼ m.p.h.—a change of pace to meet every need. Maximum drawbar pull is 4200 lb. You'll find it the

easiest operating crawler you've ever known with smooth hydraulic controls, velvety clutching, comfortable box-type operator's seat and modern low silhouette that permits maximum visibility. Its years-ahead design means greater earning power for you.

There's still more cost-cutting news for you in the new OC-46. See it and operate it yourself. Call your Oliver Distributor for a demonstration—today!

THE OLIVER CORPORATION

400 W. Madison Street, Chicago 6, Illinois



a complete line of industrial wheel and crawler tractors and matched allied equipment
For more facts, use Reader-Reply Card opposite page 18 and circle No. 267



The McKiernan-Terry Model C-5 compound steam-air pile hammer requires a smaller crane and less air or steam than conventional hammers of similar rated striking energy.

Steam-air pile hammer uses less motive power

■ A compound steam-air pile hammer that cuts almost in half the amount of motive power usually required to operate conventional hammers of similar rated striking energy is announced by the McKiernan-Terry Corp. The Model C-5 hammer also has a low total weight to ram weight ratio. The two factors combine to permit the use of a smaller crane and less steam or air to do a given job.

The C-5 delivers 110 blows per minute with a striking energy of 16,000 foot-pounds. However, the manufacturer reports, it has a very low striking velocity. This results in a minimum of pile head deformation, a problem especially when driving the new thin-wall pipe piles.

The new hammer is designed to protect itself against damage should the pile slip away from it. It can be operated without recourse to the throttle valve should the hammer be entirely unsupported by the pile. It is self-stopping when no support exists under the anvil block, and it will automatically resume operation when the support is re-established.

For further information write to the McKiernan-Terry Corp., Pile Hammer Division, 100 Richards Ave., Dover, N. Y., or use the Request Card at page 18. Circle No. 42.

Electronic computer to be used on Mass. turnpike

Starting May 1, Univac 120 will be installed on the Massachusetts Turnpike. Univac is a product of the Remington Rand Division, Sperry Rand Corp., New York, N. Y.

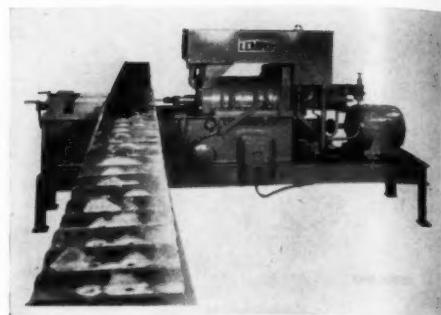
Drivers will receive a punched card on entering an interchange, and from this the turnpike authority will know the time of entry, amount paid, lane of entry and exit, and the type of vehicle and number of axles—all compiled by the Univac 120. The computer will furnish statistical reports.

Press removes, replaces track bushings and pins

■ For the removal and installation of pins and bushings on crawler tracks, Lemco Products, Inc., has announced the Model 565 Powermatic track pin and bushing press. Special tools and adapters are available for the press to service from the smallest to the largest Allis-Chalmers, Caterpillar, Euclid, International, and Oliver crawler tractors.

Centralized controls enable one operator to do the complete job of pressing bushings and pins out and in, the company reports. Field tests, the company states, have indicated that the Powermatic can reduce pin and bushing replacement time by as much as 50 per cent.

The Powermatic track pin and bushing press can reduce pin and bushing replacement time by as much as 50 per cent, according to tests by the manufacturer.

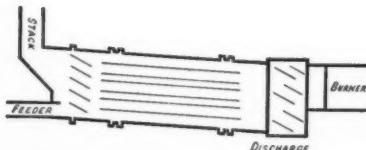


tons. The buttress and jaws are adjustable and retractable.

For further information write to Lemco Products, Inc., 5490 Dunham Road, Bedford, Ohio, or use the Request Card that is bound in at page 18. Circle No. 27.

new Littleford model 25T Trail-O-Dryer . . . and the famous Littleford Trail-O-Patcher combine to produce a new, complete

SMALL PORTABLE AS



How New Trail-O-Dryer operates

The aggregate in the dual compartment, 5-ton bin, is automatically proportioned; feeds directly into the Dryer on a reciprocating feeder. The aggregate mixture is heated and dried in a rotating steel drum. Lifts, inside the drum, raise the aggregate so there is a continuous cascade passing through the burner flame.

Trail-O-Dryer

LITTLEFORD

the world's most complete line of completely engineered



KETTLES



EMULSION SPRAYERS



HEATER-PLANER



BITUMINOUS DISTRIBUTORS



BITUMINOUS MIXERS



ROAD RUMPS

ROLLERS



PAVER-SPREADERS

black

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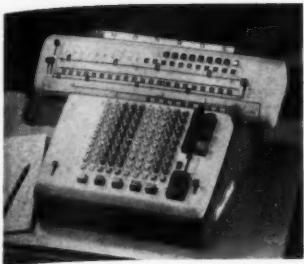
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Calculator designed to do three-factor multiplying

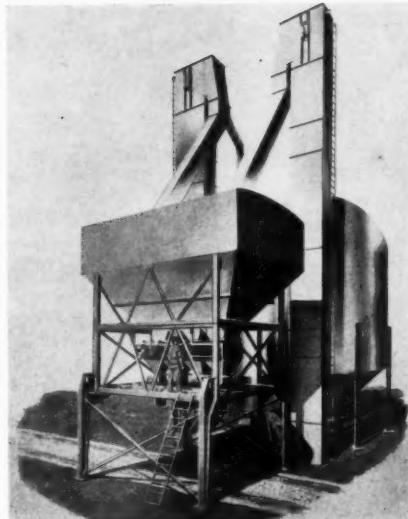
A calculator that is said to be the only machine designed to perform three-factor multiplication in one continuous operation is announced by Monroe Calculating Machine Co., Inc. According to the company, three-

factor multiplication is one of the most frequent problems encountered in construction figuring.

The Model 8-N has a transfer slide that eliminates the need for inserting each answer on the keyboard, reducing the number of steps required to solve a problem. The calculator also is capable of producing automatic decimals, eliminating one of the major causes of computation errors.

The company reports that the machine is able to handle all highway and heavy construction figuring from estimating and take-off work to invoicing and payroll.

For further information write to Monroe Calculating Machine Co., Inc., Orange, N.J., or use the Request Card at page 18. Circle No. 40.



The new Butler TX4 road batching system can keep pace with four dual-drum pavers operating at full speed, according to the manufacturer.

LE ASPHALT PLANT



Now every contractor and highway department can afford a small asphalt plant. Simply team up the brand new Littleford Trail-O-Dryer with the well known Trail-O-Patcher. The Trail-O-Dryer will produce 15 to 25 tons of hot, dry aggregate for quick mixing in the Trail-O-Patcher. Here is an asphalt plant that is simple and easy to operate, with none of the complicated controls of larger plants. Results are a good bituminous mix for driveways, county and township roads or for stock piling.

This efficient new Littleford combination sells for approximately half the price of the next largest size comparable plant. It's a size everyone can use — at a price everyone can afford.

The new Trail-O-Dryer is good news for the many owners of Littleford Trail-O-Patchers, since it will boost your output 200%! May be used with other types of bituminous mixers, too.

Operation of the Littleford Dryer-Patcher combination is simple and practically automatic . . . including automatic proportioning of gravel and sand; heating, drying and delivering the mixed aggregate to the Patcher; mixing the dried, heated aggregate with bitumen in the pugmill; and discharging the finished black top material into the discharge pan or chute for easy handling. Automatic performance like this assures better paving material, prepared right on the job, at big savings.

For information on how this remarkable new Littleford combination can help mechanize, improve and reduce the cost of your black top road construction and maintenance, send today for free descriptive bulletin 36. Littleford Bros., Inc., dept. LB 245 — 485 E. Pearl St., Cincinnati 2, Ohio.

Trail-O-Patcher



black top equipment



SUPPLY TANKS • TANK CAR HEATERS • UTILITY SPRAY TANKS

For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 268



Send for free Trail-O-Dryer bulletin

Littleford Bros., Inc.:

Please send my free copy of new Trail-O-Dryer and dual feeder bin bulletin 36 immediately and without obligation.

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

Portable batching plant feeds 4 dual-drum pavers

An automatic portable batching plant that reportedly can keep pace with four dual-drum pavers working at top speed is announced by the Butler Bin Co. The TX4 road batching system consists of three 72-cubic-yard aggregate bins and one 60-cubic-yard (405 barrels) elevated cement bin, each equipped with four completely automatic weighers. Additional cement storage is provided by a pair of 100-cubic-yard (675 barrels) silo-type cement bins working with two 422-barrels-per-hour cement elevators.

The new plant is said to be able to batch four 34E loads, consisting of sand, cement, and two sizes of stone, every 20 seconds. Double controls permit one-man operation from a central point. All controls are electrical, not electronic, for ruggedness and ease of maintenance.

Each bin is an all-welded hopper section handled in one piece and attached with four bolts to an intermediate section containing the weighing batchers wired, piped, and ready to operate. The attachment of four hinged columns completes the assembly of the portable plant. Each high-speed cement elevator is handled in two sections with chain and buckets in place. The cement storage silos are fitted with lifting lugs to permit handling in one piece.

A special feature of the TX4 plant is the Butler Airomatic cement feeder. An Airslide with an adjustable dam is operated by an electrically controlled valve with final cut-off accomplished by a quick-acting air-controlled gate. The unit is said to combine unusual accuracy with trouble-free operation.

For further information write to the Butler Bin Co., Waukesha, Wis., or use the Request Card at page 18. Circle No. 45.

Bryant named to A-C post

William T. Bryant has been named a field superintendent in the service section of the Allis-Chalmers Mfg. Co., Milwaukee, Wis. In this position Bryant will handle the erection of cement equipment.



This H-K Imperial rock plant, with a 36×40 jaw crusher, turns out all the phosphate slag used in the several courses on the new road. The Cat tractor with U-dozer, right, shoves slag to the plant trap.

Small number of rigs work swiftly

Just Out
SENSATIONAL NEW
Increased Bore

M & W PISTON POWER PACKAGE
the most powerful industrial pistons you can install

Complete matched sets for 85 industrial tractors, motor patrols, motor graders, auto patrols and engine units.

EXAMPLES OF INCREASED BORE

	Std. Pistons	M&W Pistons
ALLIS CHALMERS.....	.4"	4 1/8"
BUDA.....	3 1/8"	3 3/8"
CASE.....	4 1/8"	4 1/8"
CATERPILLAR.....	5 3/8"	6"
IHC.....	4 1/8"	4 1/8"
LEROI.....	4"	4 1/8"
MINNEAPOLIS-MOLINE.....	4 1/8"	4 1/8"
OLIVER.....	3 1/2"	3 1/8"

- Years in development—Introduced for the first time by the company long famous in power boosting equipment

Distribution plans are now being set up throughout the United States and Canada so that these remarkable power pistons will be available anywhere in North America.

M&W Add-POW'R Pistons give proved power and work capacity increases to any industrial tractor or engine unit.

Today you are faced with higher fuel, labor and equipment replacement costs. These higher operating costs, plus the mounting pressure of getting jobs done on time or even ahead of schedule makes it more important than ever before that your equipment be more efficient and do more work. New M&W larger bore Power Pistons will solve your problem and boost your horsepower 20%.

Reports from owners installing M&W Piston Power Sets prove any unit will do more than enough additional work to pay for your operator's time as well as part of your fuel cost. Send for a complete list of M&W Add-POW'R industrial piston and sleeve specifications.

PHONE, WIRE OR WRITE TODAY!



M & W TRACTOR PRODUCTS
ANCHOR, ILLINOIS • PHONE 37

For more facts, use Reader-Reply Card opposite page 18 and circle No. 269

With only a few pieces of construction machinery—all of them operating at top productive speed—Carl E. Nelson Construction Co., Inc., shaved months from the schedule of a 44-mile job on U. S. 10 in Montana, making it possible for the state to open its first four-lane divided highway at least a year ahead of schedule.

Work on this section of the road was similar to another of Nelson's jobs on the same highway. This was a 6-mile section, graded under a separate contract by James A. Crick & Sons, Spokane, Wash. Nelson produced and placed the subbase material and completed first-stage surfacing almost eight months ahead of time on this stretch.

Grading work was done by Fred H. Slate, Inc., Portland, Oreg., on the shorter stretch, which runs 4.4 miles from Butte to tie in with the longer section. As with the 6-mile job, the 48-foot roadbed was built up with 12 inches of 2-inch-minus subbase. Then 4 inches of 3/4-inch-minus cushion material was put down and the upper 2 inches stabilized by SS-1 asphalt emulsion.

The 36-foot riding surface consists of a single-penetration application of MC-5 asphalt at a rate of 0.35 gallon per square yard, covered with 25 pounds of 1/2-inch-minus chips. Plant-mix surfacing may be done in the next few years. Only in the section within the city limits of Butte were such things as curb and gutter work and traffic channelization necessary.

Subbase unusual

The granular subbase material used on this project was not the conventional gravel or crushed rock typical of many western projects, but crushed slag. This material was available from the Victor Chemical Co., located seven miles west of the Butte city limits, which specializes in the production of agricultural phosphates. In order to take advantage of this low-cost material, the Montana State Highway Commission drew specifications around the use of the crushed slag for subbase.

The material, a by-product of an industrial process, has a number of advantages, according to state engineers. It is inexpensive. It is free from excessive fines that tend to introduce

**204,000 tons of low-cost crushed slag used
for subbase, leveling, bituminous penetration
courses for 4.4-mile job**



An International R-190 truck-tractor and a Fruehauf rock-body combination pick up a 23-ton load of 3/4-inch-minus crushed slag at the plant. The trailer has air-controlled gates for bottom-dumping loads in windrows.

Work swiftly on highway subbase

a high plasticity index in the material. And it is relatively easy to crush with conventional crushing and screening equipment.

Nelson handled the job of crushing about 204,000 tons of this material for subbase, leveling course, and for the cover of the bituminous penetration course, and kept all equipment units working productively at a constant pace throughout the entire job.

Fast Production

Production and laydown of the 2-inch-minus material moved along at an average rate of 400 tons per hour, despite the fact that 65 percent of the raw supply had to be crushed. Production of 3/4-inch-minus material ranged up to about 250 tons per hour.

The reduction plant was an H-K Imperial master rock plant, manufactured by Flaherty Equipment Co., Pocatello, Idaho. The main plant was driven by a Caterpillar D375 diesel engine, while the 36×40 primary jaw reduction unit—set near the feeder—was driven by a Caterpillar D17000 diesel.

Two Caterpillar D8's and U-dozers shoved the raw material to the trap directly over the mechanical feeder, and acceptable material was sent directly to a 20-cubic-yard storage hopper. Material passing through the 36×40 jaw crusher was routed through the main H-K Imperial rock plant. After passing by means of a split feed through two Cedarapids 40×24 roll crushers, the rock, reduced to specifications, went by stacker conveyor to the surge bin.

The only auxiliary piece of equipment at the plant—aside from the two Cats with U-dozers—was a Michigan Model 175A tractor shovel that handled some of the raw material and did cleanup work.

The finished rock was hauled to the road by a fleet built around six new hauling units. These were International R-190 truck-tractors pulling Fruehauf rock trailers with a 23-ton payload capacity. The semitrailer units, with axles spaced at 32 feet, are equipped with air-controlled gates so that loads can be bottom-dumped with accuracy and speed.

In addition to this company-owned
(Continued on next page)

On the Massachusetts Turnpike



Bigger tonnages with BatchOmatic

200 tons per hour—that's the kind of production Alexander Construction Co. is getting from its 6000-lb. BatchOmatic. This plant will produce 115,000 tons for a 13.4-mile section of the Massachusetts Turnpike.

Forty miles eastward a 4000-lb. BatchOmatic—one of

three owned by Bayer & Mingolla—consistently produced at maximum tonnages.

Designed from their original conception for automatic operation, all three Barber-Greene BatchOmatic plants boost production, cut costs and expand the market.



Faster paving with a finisher team

Near Blandford, three Barber-Greene Finishers pave in echelon, laying 10', 12' and 16' strips simultaneously. A fourth finisher paves interchanges.

Barber-Greene Finishers have always had the traction, maneuverability and control to take any job in stride.

And today's improved finisher has more power, paves faster, travels faster with lower maintenance cost. This is the finisher that sets the pace for quality paving over the world—the finisher that is now paving its second million miles—more than all others combined.

Write for information on the world's most modern equipment for building asphalt roads.

57-2-WB

Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 270



A Caterpillar No. 12 motor grader road-mixes the crushed slag base as water is applied to the material by one of the truck-mounted water tankers used on the project.

All compaction is handled by this Seaman-Andwall compactor, which carries an extra 1,000 pounds of ballast in addition to the regular ballast of 160 pounds per linear inch.



(Continued from preceding page)

fleet, Nelson used eight Ford, International, GMC, and Chevrolet ten-wheel trucks. After picking up loads weighed on Murphy scales, the haul units sped to the road to dump the material. The 2-inch-minus material was put down in 3 to 4-inch lifts. After 12 inches had been placed, the upper 4 inches of Type A, $\frac{3}{4}$ -inch-minus rock was put down in 2-inch lifts. The top 2 inches was mixed with asphalt emulsion before it was laid out on the road.

The Type SS-1 asphalt emulsion used in the upper 2 inches of granular material was trucked in from the refinery at Laurel, Mont., and applied to the flat lifts by Nelson's own specially built water tanks designed with pressure system spraying nozzles.

All the subbase material placed was road-mixed by only two Caterpillar No. 12 motor graders. Several 3,000-gallon water-tank trucks, equipped with pressure spray nozzles, hauled water to the road for the blade-mixing operation.

The crushed slag and asphalt emulsion making up the top 2 inches of the roadway was also blade-mixed by the two motor graders before the material was rolled.

All rolling on the project—from initial rolling through final compaction—was done by a Seaman-Andwall Sta-Bilt rubber-tire compactor that was ballasted with an extra 1,000 pounds in addition to its regular water ballast of 160 pounds per linear inch of tread. Making four passes, this rig developed 95 per cent of AASHO compaction in the road. The compactor is a self-propelled unit, powered by a Continental engine, that has eight pneumatic tires on the front axle. The nine tires on the rear axle are staggered to overlap the impressions made by the front tires.

The individual spray nozzles for each tire, used when the rig compacts a freshly laid oil mat, prevents the tires from picking up oil during a job. It has a turning radius of only 21.5 feet, and, according to the superintendent on this project, it did not scuff the surface when it made a turn. The rig has been designed with a low center of gravity so that it can roll moderate slopes.

The road surface—which is ex-



"Material-handling worries ended," reports leading Wisconsin building contractor

TIME, LABOR COSTS CUT IN HALF by versatile Michigan Tractor Shovel

Savings of 40 to 90% in time and 50 to 75% in labor costs resulted when the Selmer Company, Green Bay, Wisconsin, assigned material handling to this Model 75A Michigan Tractor Shovel.

"You might say the Michigan combined the mobility of a pickup truck with the traction of a crawler," explains one Company official. "It certainly eliminated the usual problems of unloading and moving building supplies: the slow expensive hand labor . . . the slowness and lack of mobility of crawler-loaders . . . the lack of capacity of easy-to-get-stuck farm-type tractors."

Saves 3 man-hours unloading blocks

In the two years since its purchase, Selmer has handled dozens of jobs over to the 1½ yd 80 hp Michigan. Above is a common assignment—moving palletized concrete blocks from trucks to scaffolding. Unit lifts 68 blocks, weighing 3,800 lbs AT ONCE. These are stacked 10 ft high so laborers can skid blocks direct onto scaffolds. Entire job, including

stacking, takes two men 10 minutes. Unloading alone to take five hand-laborers an hour. And an elevator to be set up and used continually.

Saves \$15 to \$25 per brick truck

Similar savings are reported when brick is handled to take four men using brick tongs three hours to unload a semi-trailer. Now, Selmer has the bricks palletized in 500-unit lots, 12 pallets to the semi . . . unloading the Michigan and two men 10 to 15 minutes. Smaller units carry 4 pallets, take 5 minutes to unload with the Michigan compared to 1½ hours with four hand laborers. Selmer average \$15 to \$25 per truck including extra charges for palletizing!

Replaces expensive crane to unload marble

Unloading carloads of marble or cast stone always presents a costly headache too. Formerly, Selmer Company

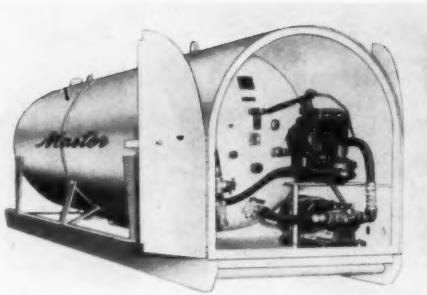
pected to last for perhaps four years—consists of the single-penetration shot of MC-5 with a cover coat of chips.

Personnel

The project was under the general supervision of Scott P. Hart, state highway engineer, who has headquarters in Helena. S. B. Sanders is construction engineer, and W. C. Birkemuel, project engineer. Lewis Chittim is resident engineer.

Heading the contractors' forces was James Kennaday, construction superintendent, and C. G. Charles, office manager.

THE END



Butane-propane dispenser has skids for portability

■ A butane-propane portable filling station, skid-mounted for portability, is announced by the Master Tank Welding Co. The dispenser is recom-

mended for use in filling small-capacity LP-gas fuel tanks right on the job. It is available in capacities of from 1,000 to 6,500 water gallons.

The Master portable filling station is equipped with a hose, a visual float gage, and an explosion-proof motor and switch to operate the pump. Heavy-duty doors with fittings for a lock make it tamper-proof. Extra-strong lifting lugs are attached with a 6-inch continuous weld to facilitate handling of the unit.

For further information write to the Master Tank & Welding Co., Dallas, Texas, or use the Request Card that is bound in at page 18. Circle No. 43.



Lumber —as much as $\frac{3}{4}$ of a truck load (3500 to 4000 lbs) unloaded at once, stockpiled, later carried to hoist.



Rolls of reinforcing wire—carried on forks, stockpile to hoist. Fork spacing changed in seconds to fit roll openings.



Trash —cleaned from around building site.

One man changes bucket, forks

Some of these jobs, you'll note, call for fork lift, some for tractor shovel bucket. These two attachments (and others) are easily interchanged. It takes Selmer's operator, John DeMoulin, working alone, 10 minutes.

In two years, NO breakdowns

No matter what the job, Selmer Company can depend on their Michigan working a full day! "In two years . . . over 6,000 operating hours," recalls Shop Foreman Tilkens, "we've NEVER had the machine break down on the job. It has saved us over 50% in time and manpower!"

A Michigan could do as well for you!

Michigan is a registered trade-mark of



CLARK EQUIPMENT COMPANY
Construction Machinery Division
2407 Pipestone Road
Benton Harbor 28, Michigan
In Canada: Canadian Clark Ltd.,
St. Thomas, Ontario

For more facts, use Reader-Reply Card opposite page 18 and circle No. 271

Portable aggregate plants

■ The new Pioneer 44-55 Series of portable crushing and screening plants is the subject of two pieces of literature from the company. The duplex-type plants have a four-deck screen which, through its flexible screening and spouting arrangement plus a full deck of scalping screen ahead of the jaw crusher or a full deck of sand screening area, allows high total production of one, two, three, or four sizes of closely graded product.

An 8-page brochure contains a large cutaway illustration showing the flow of material for simultaneous production of four product sizes; diagrams of nine different screen arrangements; field reports and photos; text explaining plant features; and brief specifications. The other literature gives complete specifications, as well as diagrams showing arrangements for the delivery conveyors.

To obtain Forms 661 and SED 32 write to Pioneer Engineering Works, Inc., 3200 Como Ave., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 15.

Wire rope specifications

■ By means of photographs and drawings with reeving diagrams, a new brochure from the Macwhyte Co. lists the proper wire rope specifications for all types of construction machinery. Included is a discussion of lang lay versus regular lay rope, rope constructions, and the proper wire rope to use for clamshell bucket operation.

To obtain Bulletin 5702 write to the Macwhyte Co., 2940 14th Ave., Kenosha, Wis., or use the Request Card that is bound in at page 18. Circle No. 14.

Bituminous distributors

■ A six-page catalog from E. D. Etnyre & Co. presents the various Model MX Black-Topper distributors for heating and applying asphalt, tar, emulsion, or road oil. Full details and specifications are given for all units in the Model MX line. A chart showing standard tank capacities, weights, and mounting data is also included.

To obtain Bulletin No. 508C write to E. D. Etnyre & Co., Oregon, Ill., or use the Request Card at page 18. Circle No. 84.



Eliminates ramps, pump set-up for concrete

Above is another home-made attachment . . . a concrete lifter which can be lifted on the Michigan forks. It carries four wheelbarrowfuls per load. Pour is made simply by pushing forks slightly forward so concrete flows out of 6" spout into forms. Time and labor of barrow-men are saved. Nor does Selmer have to build ramps or, on small pours, set up a pump.

Handles wide variety of other materials

Other materials have been handled from time to time, some of them are:



always *rip-rap* —old brick bats and concrete dozed into river to protect building.

Bituminous paver works at top speed of 102 fpm

A new bituminous paver that can operate at speeds as high as 102 fpm and produce uniform high densities without tearing the bituminous mat is announced by the Iowa Mfg. Co. The Cedarapids paver worked on sections of the Kansas Turnpike at speeds up to 84 fpm, handling more than 200 tons of bituminous material hourly, the company reports.

The most important feature of the new paver is said to be an electrically vibrated screed which "irons" the bituminous material into a smooth, uniform, high-density mat. The vibrating action of the screed greatly reduces the possibility of tearing the mat or causing voids and permits the high-speed paving, the company states.

The screed is of one-piece construction and is vibrated at 3,600 impulses per minute by four electric vibrators, each of which is controlled by a rheostat to regulate the intensity of vibration. Two screw adjustments with vernier-type gages control mat thickness. Separate front and rear crown adjustments can set the screed to pave from a $\frac{3}{4}$ -inch negative to a 3-inch positive crown.

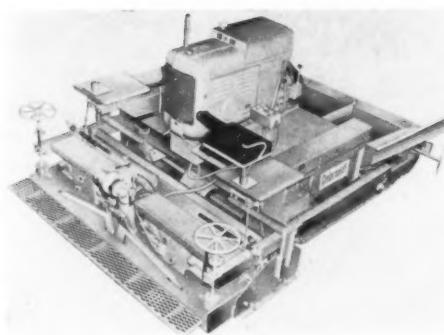
The paving width can be adjusted from 6 to 14 feet in $1\frac{1}{2}$ -inch increments. Heat from a 150,000-Btu oil heater is evenly distributed to the screed by an enclosed flue. Long screed support arms pivot well forward on the paver, with a ball-joint connection which allows minor side movement of the screed to assure straight mat edges and even joints on the straight-away as well as on the curves.

The new paver has 15 working speeds and three travel speeds. A separate reversing gear provides the same choice of speeds in both directions. With the engine working at 1,800 rpm, the entire range of working speeds can be effected without changing the engine speed.

Most of the paver operations are controlled by electric switches on the operator's panel. Two toggle switches are used for steering, and two push-button switches provide individual control of the slat feed conveyors and spreading screws. One toggle switch controls the vibrators. Switches to cut in the automatic controls are located under the radiator. On the back platform are the depth control wheels, crown adjustments, and rheostats for the vibrators.

Automatic depth feelers maintain the proper amount of bituminous mix in front of the screed at all times. The amount of material in front of the screed raises or lowers the feelers to actuate micro-switches which control the electric clutches that operate the slat conveyors and spreading screws. When the material gets too high, the flow from the hopper to

Working on the Kansas Turnpike, the new Cedarapids bituminous paver operated at 84 fpm handling more than 200 tons of material per hour, the company reports. The paver uses an electrically vibrated screed which permits paving at up to 102 fpm with uniform high densities and without tearing the mat.



the screed is automatically stopped. The hopper can handle up to 9 tons of material without spillage.

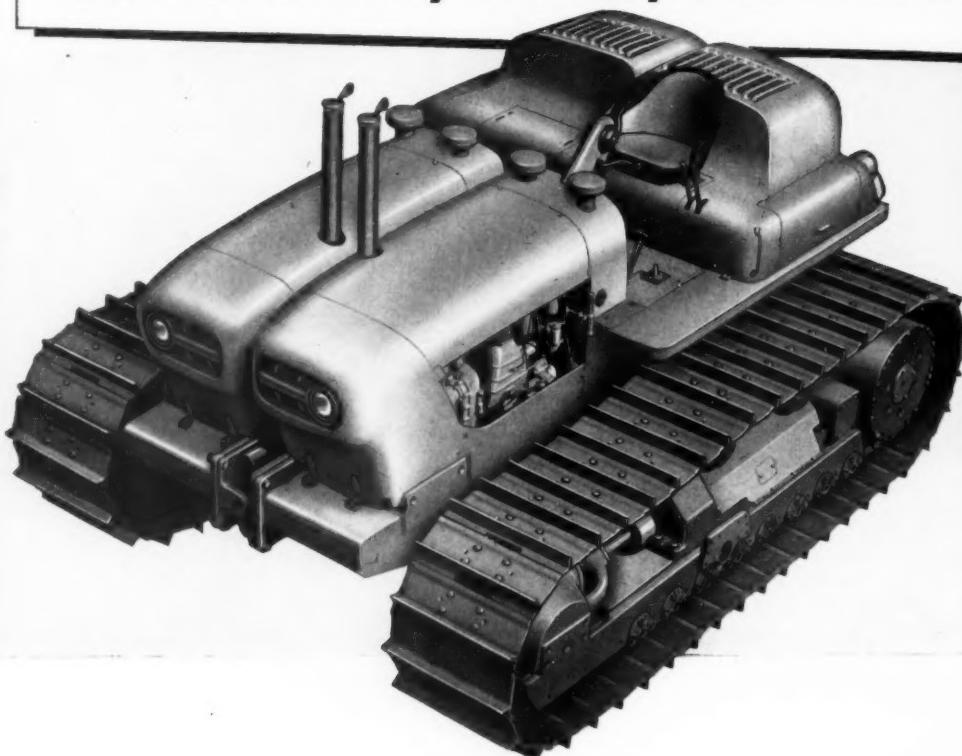
For further information write to the Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 48.

Concrete vibrators

Flexible-shaft concrete vibrators manufactured by Wyzenbeek & Staff, Inc., are detailed in a bulletin from the company. The Wyco gasoline-powered units are available in three sizes, each with various length shafts, and the largest with an engine de-

NOW THE Euclid TC-12 GIVES YOU

**more horsepower... more track area...
more accessibility than any other crawler!**



Ever since it was introduced more than a year and a half ago, the Euclid TC-12 Tractor has set completely new standards of crawler production and performance. It has proved, on job after job, that it is years ahead of the field in ability to do more work—faster, easier and cheaper. Now the TC-12 has even more power to handle the biggest tractor jobs.

Powered by two 218 h.p. engines with separate Torqmatic Drives for each track, there's a total of 436 horsepower. Big 27" standard shoes and

8 track rollers give good balance with the additional horsepower, heavy duty dozer blades and other attachments.

This new TC-12 Crawler has many other improvements that put it even further ahead of other tractors . . . in performance, ease of operation, maneuverability and service accessibility. Ask your Euclid dealer to prove that the TC-12 has no equal for big tractor jobs and have him show you why **Euclids are your best investment.**

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



stopped.
to 9 tons
write to
16th St.
the Re-
e No. 46

vibrators
& Staff,
in from
gasoline-
in three
n shafts,
ine de-

veloping up to 6 horsepower and a 12-inch pneumatic wheel for ease in moving.

The various units are described completely. Also shown is a line of accessories, including left-hand angle heads, straight grinding heads, wire brushes, and a water can with a shut-off valve and a 10-foot hose.

Specifications for the vibrators, as well as for the shafts and vibrator head components are given. Also shown are an electric concrete grinder, an electric terrazzo grinder, and two gasoline-engine grinders.

To obtain Catalog 55-V write to Wyzenbeek & Staff, Inc., 223 N. California Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 12.

Mobile Drilling buys drill business of Buda Division

The earth-drill business of the Buda Division, Allis-Chalmers Mfg. Co., Milwaukee, Wis., has been purchased by Mobile Drilling, Inc., Indianapolis, Ind. The acquisition will increase the range of models and sizes of earth drilling equipment offered by Mobile Drilling.

No other products of Buda or of Allis-Chalmers Co. are involved.

The pneumatic-tire Hyster 70 is 106 inches long and has a turning radius of 100 inches.



Lift truck features compactness and power

A pneumatic-tire lift truck with the compactness for working inside a single-door boxcar, and the traction and capacity for handling 7,000-pound loads over rough terrain, is available from the Hyster Co. The Hyster 70 has a turning radius of 100 inches and a length of 106 inches.

The lift truck, powered by a gasoline engine delivering a rated torque of 182 pounds-feet at 1,200 rpm, has a hydraulic booster-type power steering as standard equipment. A floating drive axle offers a 4 to 1 reduction at the drive wheels to reduce strain on transmission components.

The rig can be equipped with such attachments as standard pallet forks, a carriage side-shift, a carriage swing-shift, and a crane boom. Diesel engines, LP-gas fuel systems, and dual drive wheels are among the optionally available features.

For further information write to the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card that is bound in at page 18. Circle No. 38.

Light trailer axles

A folder describing what is reported to be one of the lightest trailer axles ever built is available from the Timken-Detroit Axle Division of the Rockwell Spring and Axle Co. The TK-500 axle is said to save up to 140 payload pounds per axle.

The weight savings are accomplished by means of alloy-steel pierced spindles, a one-piece brake spider and flange, lightweight steel hub and drum assemblies, rigid Fiberglas dust shields, and light-weight nylon camshaft bushings and supports. All parts of the TK-500 axle are pictured and detailed.

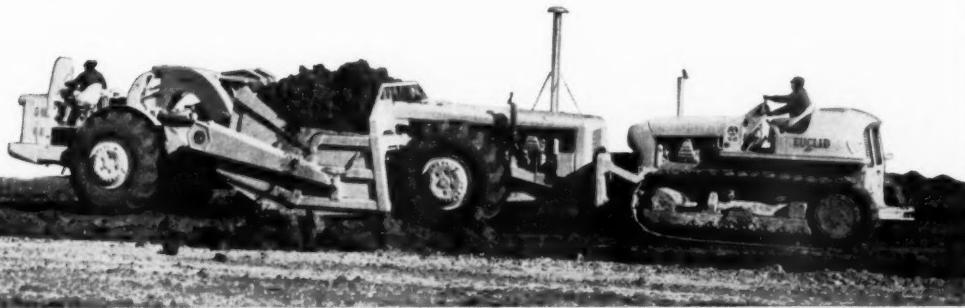
To obtain Folder SP-5601-B write to the Timken-Detroit Axle Division, Rockwell Spring and Axle Co., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 21.

Sherman Products expands

A new building, which will provide 15,600 square feet of floor space, was added last month to the plant and offices of Sherman Products, Inc., Royal Oak, Mich. The building, located on West Fourteen Mile Road, will be used for the production of power diggers, auxiliary transmissions, and power steering units for tractors, and for an expanded service department.

--For more facts, circle No. 272

20% MORE WORK-ABILITY



Euclid "Twins"—the TC-12 Tractor and Twin-Power Scraper—will move the cheapest dirt on the big road program or on any earthmoving job. They can set new production records at lower cost on your operations.

The Euclid TC-12 has exceptional maneuverability because each track has a separate power train. Operator has excellent visibility and "hair trigger" control of steering in any of the three speed ranges, forward or reverse.



With separate Torqmatic Drive for each big track, the TC-12 is fast on its feet, with plenty of power and traction for any big tractor job. It has proved its ability to outwork any other tractor on dozing, clearing, push-loading scrapers and pulling big equipment.



A high production machine, the TC-12 is easy to operate—delivers more push-pull drawbar horsepower at high travel speeds. Utilized assemblies and easy accessibility of major components permit servicing without tear-down of other parts.

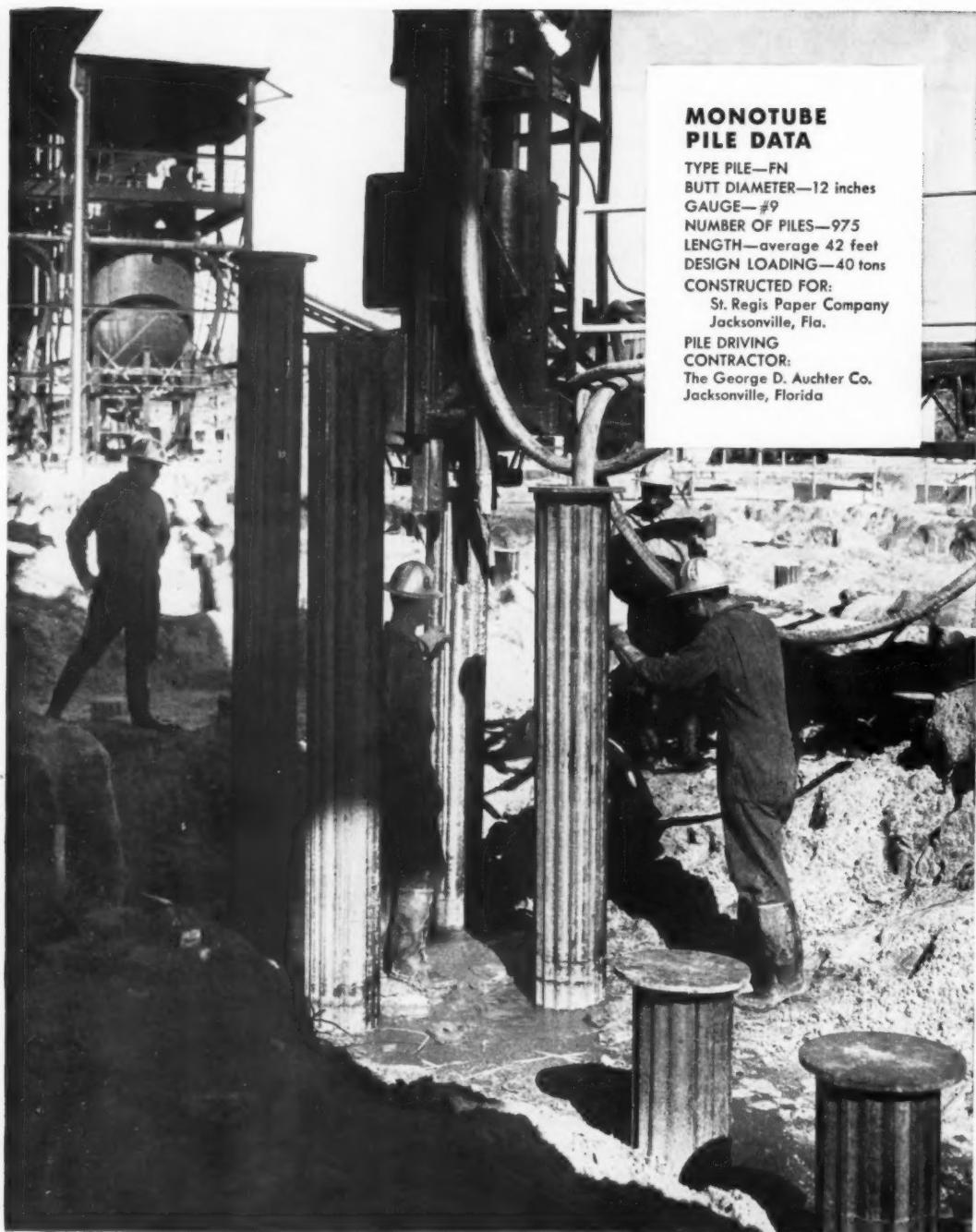


For push-loading big scrapers the Twin-Power "Euc" crawler has no equal. Torqmatic Drive provides a smooth, steady flow of power—changes from one speed range to another and from forward to reverse are made under full power.

The Engineering Department

Brick masonry, stone and granite

by GEORGE E. DEATHERAGE, P. E.,
construction consultant



MONOTUBE PILE DATA

TYPE PILE—FN
BUTT DIAMETER—12 inches
GAUGE—#9
NUMBER OF PILES—975
LENGTH—average 42 feet
DESIGN LOADING—40 tons
CONSTRUCTED FOR:
St. Regis Paper Company
Jacksonville, Fla.
PILE DRIVING
CONTRACTOR:
The George D. Auchter Co.
Jacksonville, Florida

Although many substitutes are being provided for brick masonry, the adaptability and durability of clay products will never be equaled or superseded by the substitutes. Prices for materials and labor have more than doubled since prewar days, and the only possible chance for cost reduction lies in better design, modern job techniques, and better job planning and production.

It is a common practice to estimate brick masonry by the square or cubic foot of wall, and then convert this to a price per thousand brick. All door, window, and other openings should be deducted in order to arrive at the actual materials needed. In estimating wall with tile or cinder-block backup, each material will need to be taken off separately and priced, or a composite price per square foot of wall computed to include labor and material.

In building a composite price per square foot of wall, it is a good practice to make the calculations per 100 square feet to be sure of working with whole numbers instead of fractions. It is best to use a process chart—setting down the functions to be performed in a step-by-step sequence. The logical flow of the working cycle, from start to finish, can be quickly set down on the process chart, and this procedure will bring out each step clearly.

All job overhead items are listed first and in proper sequence, with an entry for brickwork. Under this, every dimensional takeoff is posted—the length, height, and width or thickness. It will facilitate matters if the estimate sheet is ruled off in vertical columns for the various thicknesses of the wall, such as 4, 8, 12 inches. When the brick takeoff is completed, the totals for each wall thickness is posted at the bottom of the last sheet.

It is dangerous to take off all the 8-inch walls, then the 12-inch walls and post these to different sheets, since something may be overlooked. A complete takeoff for one side of the building should be made at one time. If an 8-inch wall occurs in one panel, the area is posted in the vertical column marked 8 inches, and if the next panel is 12 inches, that total is entered next under the heading, 12 inches. Following this procedure, the estimator completes the takeoff for one side of the building

ASSURANCE + ECONOMY with Monotube piles. St. Regis Paper is typical of the many industrial companies relying upon Monotube steel piles for permanent, dependable foundation support. Tapered, fluted Monotube piles are available in lengths, diameters, and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio for complete information.

UNION METAL
Monotube Foundation Piles

For more facts, use Reader-Reply Card opposite page 18 and circle No. 273

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This is the sixteenth in a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

needed in the location, width, and height of rough openings in the walls and the selection of the ceiling heights. Using these tables in preparing the original layout of the building will eliminate the tedious and costly job of cutting units on the job to fit odd lengths or heights, and will result in a neater and speedier erection of concrete masonry. Full advantage should be taken of jamb, corner, and header blocks, and bullnose corners.

Building codes should be consulted when estimating blockwork, since the allowable compressive stress is low,

and hard brick may be required for steel bearings, and to meet other conditions. A membrane waterproofing should be used for blockwork below grade, and a special paint for blockwork above grade. Window sills may be of precast concrete, special blocks, or brick rowlock; the same applies to coping. These items are usually estimated per linear foot, and are separated from blockwork.

The brushing and cleaning down of brickwork is estimated per square foot of surface. One man will clean about 80 square feet per hour using a weak

P. E.
sultant

before starting on the next.

If the takeoff is for wall work, it is customary to figure the work in square foot of wall. In foundation work, the takeoff is made in cubic feet, and for brick walks and pavements, in square feet.

Unit and scaffold costs

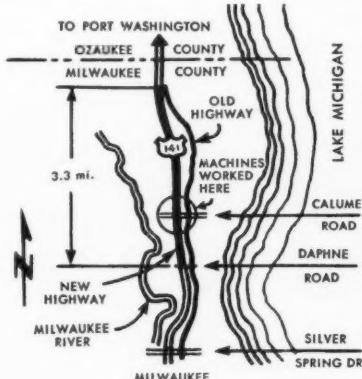
If unit costs are to be used, they should be checked by taking subbids, reducing the lump sum bid to a square-foot or cubic-foot basis, and checking against the costs prepared by the estimator. These checks are useful as a record for future estimates. As with any other unit costs, published bricklaying costs are approximations, and if they are used as a base, they will have to be adjusted for job conditions and local labor conditions. If a contractor has not been used to doing his own brickwork, he should sublet the work; in this way he can become acquainted with current costs.

In many parts of the country, scaffolding is figured for the entire job—with or without hoisting facilities—and then reduced to a cost per square foot of wall, per cubic foot, or per 1,000 units in the wall. It is vital to production to have another section of scaffolding complete before the masons have completed the work on a first scaffold. Scaffold costs are carried in the unit-price tabulation.

Concrete, cinder block

For concrete, cinder, and slag block masonry, it is usual to estimate the work per square foot of wall for the various thickness. The class of workmanship and the cost of block work can be materially improved by taking advantage of the special shapes available and the design of the work for the proper coursing. Tables can be secured from the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill., on course heights and stretcher lengths of walls. The most economical construction is based on the selection of wall lengths and stretcher lengths given in the tables. Similarly, the location and the width and height of rough openings should fit these dimensions, and start and finish at even-course heights.

To avoid cutting, a maximum adjustment of only 4 inches in the width and length of any building is required to use full and half length units. A slight adjustment is also all that is



New C Fullpak is push-loaded in 38.5 seconds over a distance of 100'. Loads averaged 12 pay yards of wet, chunky clay.

Speedway Contracting Co. speeds relocation of U.S. 141

near Milwaukee, with easy-loading C Fullpaks

To help solve heavy traffic problems north of Milwaukee, Wis., construction is in progress to straighten and widen Highway 141—main arterial highway between Milwaukee and Port Washington. Speedway Contracting Co., Milwaukee, contracted to move 345,000 cubic yards of clay on a 3.3-mile section of the highway. Work on this new section involved grading for 4 lanes of divided highway... plus building side-road approaches. To speed construction, Speedway added 3 new C Fullpak Tournapulls and an Adams 660 grader to their equipment fleet.

12 loads per hr. on 1900' cycle
At one phase of the operation 2 of Speedway's new C Fullpaks were loading wet clay and hauling to fill area for overpass on main highway. In spite of heavy, chunky materials, easy load-

ing Fullpaks were push-loaded with 12 pay yards per load, in an average of 38 sec. New, low and wide Fullpak bowl design kept dirt boiling in... filling all corners of bowl fast.

Average round-trip time on the 1900' cycle was 4.1 min., for a total of 12 loads per 50-minute hour.

Keep working productively after rain

An unusual amount of rain kept haul roads and working areas wet and spongy. This is where Speedway's C Fullpaks made good use of their power-transfer differentials... kept working and traveling productively in the wet clay. (Exclusive Tournapull differential transfers up to 4 times the power from slipping wheel to the wheel on firmest footing.)



Tournapull—Trademark Reg. U.S. Pat. Off.
Adams, Fullpak—Trademark PAG-1201-H-b-6



▲ Adams 660 levels fill and maintains haul-road. "660" has 8 forward speeds, 1.3 to 26 mph; 4 reverse gears, 1.1 to 13.7 mph; and 4 optional creepers 0.23 to 1.82 mph for better work capacity.

High apron lift, 90° turnability, speeds spread on fill for overpass. With electric controls and big air brakes, operator maneuvers safely on narrow hill.

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
Where Quality is a Habit

For more facts, use Reader-Reply Card opposite page 18 and circle No. 274

muriatic acid solution.

Brick and Tile

Firebricks— $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$ inches—are termed a 9-inch straight. There are also many special shapes such as splits, soaps, checkers, wedge, and arch brick. The quality varies, depending on the heat to which they will be subjected. Labor costs will vary greatly with the class of work, whether it be for chimney linings, fire boxes and breechings, boiler settings, and fireplaces.

Glazed brick and tile are estimated per square foot of wall. There are both enameled and glazed brick and tile of many varying shapes and sizes. If the job is of any size, the manufacturers will, if sent the plans, make a detailed takeoff for all sizes and shapes, as

well as present a quotation. A manufacturer's takeoff is good insurance for the estimator not familiar with this class of work.

White cement is usually used for glazed brick and tile work, and many times specifications require white sand. The usual mortar prices will not apply here and a new unit will need to be created. Unloading and handling costs are very high, as chipping on the face destroys the material. Prices vary also as to finish and color and this must be given its proper consideration. Labor will run three or four times that of the ordinary face brick work.

Tile is made in two types—nonload and load bearing. Backup tile for masonry walls comes in standard sizes, but the height is designed to break

evenly with the brick courses. This tile may have smooth exposed surfaces, or be scored and grooved to take plaster or another finish. In addition, there are special interlocking types designed to bond with the brick headers. Others may have a glazed face on one side. Labor hours are usually calculated per 1,000 units, this being reduced to a price per 100 square feet. A waste allowance of 4 per cent should be made for nonload-bearing types, and 2 per cent, for load-bearing tile.

Partition tile of structural clay are of various thicknesses—from $3 \times 12 \times 12$ to $12 \times 12 \times 12$ —and are either plain, glazed, or scored to take other finishes. The estimator should make the same allowances for waste as for backup tile.

For more facts on insert, circle No. 276.

For furring tile work, most manufacturers will make a detailed takeoff and send in a price breakdown, if supplied with the plans and specifications. Considerable care must be used in taking off the shapes for inside and outside corners, jamb returns, cove base, and lintel returns, as these are expensive. Work is estimated per square foot, but before this can be determined accurately, all materials, including the specials, must be listed or billed in order to secure an accurate material cost. The cost will depend on the number of openings and corners in this work. Unloading and storage costs are high, as they are with all glazed products.

Stonework

The several classifications of stonework have to do with the kind of stone and the way it is laid in place. If there are several classifications being used on one job, each has to be taken off and priced separately. Stonework is a specialty and unless the contractor is experienced in this class of work, it is best to take subcontract prices. The various types of stone are generally known as rubble, rustic or cobble stone, ashlar or cut stone, stone veneer, and trim.

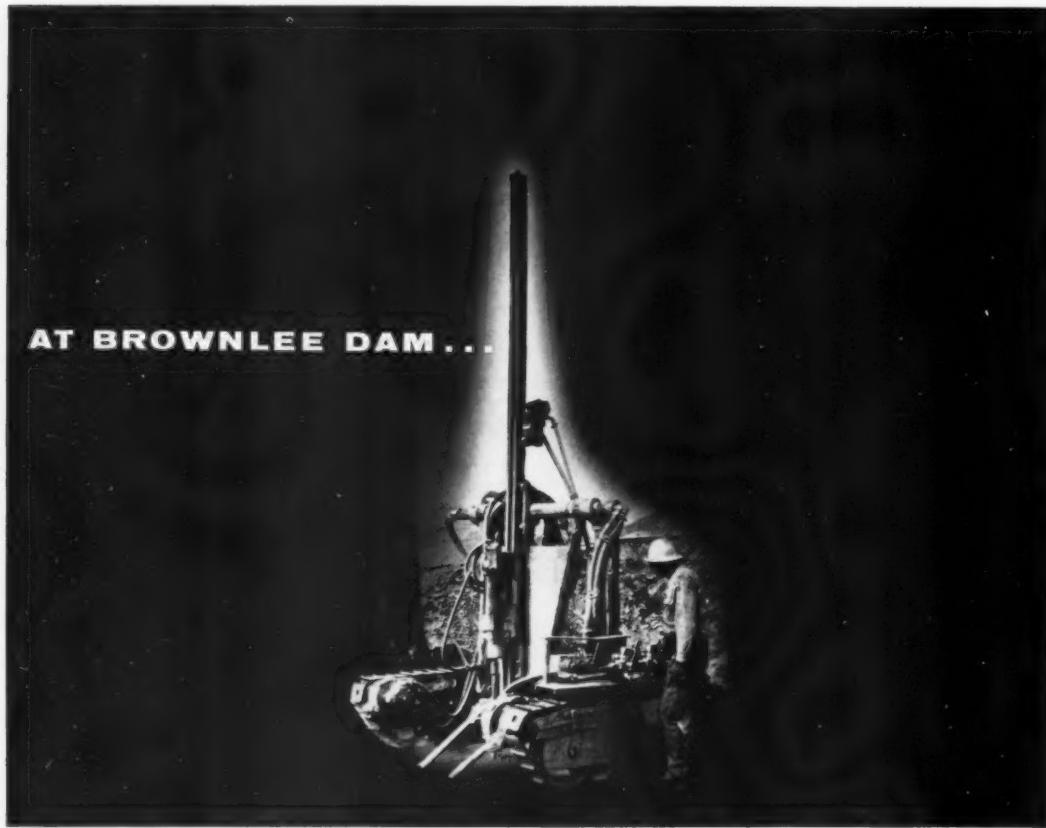
Stonework can be estimated by the cubic yard, cubic foot, perch, cord, square foot for veneer, and by the ton. The perch will change in value in different parts of the country—containing $24\frac{1}{4}$ cubic feet in some parts, and only 22 or $16\frac{1}{2}$ cubic feet in others. The best practice is to estimate by the cubic feet, as this can be readily converted to other units. In all cases the estimator should follow the local tradition and practice.

Rubble stone work, ordinarily used for rough foundations, consists of irregular size stones requiring 6 to 10 cubic feet of mortar per cubic yard of stone in place. Rustic or cobble stone is generally used for such things as rough piers and chimneys. The material, which is stone or boulders from 3 to 16 inches in diameter, is ordinarily backed up with some other material such as common brick. Mortar will be from $\frac{1}{3}$ to $\frac{1}{4}$ of the total volume. Ashlar is a cut stone set in various ways; coursed ashlar is set in regular courses with random or irregular coursing, which may require considerable cutting on the job. Usually ashlar is supplied from 4 to 8 inches thick, and from 1 to 12 inches high to bond with the backup brick. All the variable factors that influence brick masonry costs apply to this work. Unless the job is subcontracted, the estimator will have to build up a unit cost in place.

Limestone

Cut stone, which is estimated by the cubic foot, is manufactured at the mill and shipped to the job ready for placing. Indiana limestone or local limestone is more generally used than any other type. Suppliers will quote prices from the architectural drawings; this price includes delivery of the stone to the job site. Technical (Concluded on page 103)

AT BROWNLEE DAM...



A VARIED SCHEDULE... A VERSATILE DRILL THE *Joy* JUNIOR CHALLENGER

Monday

10:30 a.m. Drilled 4 vertical holes—26' deep finished by 12:15 p.m.
1:00 p.m. Moved to lower level... drilled one hole 22' deep, 3" diameter.
2:00 p.m. Moved drill to high ground to drill horizontal holes.
4:00 p.m. Drilled 2 horizontal holes in shattered rock at high location... 22' deep—finished 5:00 p.m. Quit for blasting.

Tuesday

7:00 a.m. Moved to lower level. Began drilling 4" dia. angled holes beside other drills drilling $2\frac{1}{8}$ " dia. holes. Other drills pulled off location for inability to penetrate clay in a water course at 15'. Drilled 11 holes, 24' deep, in $6\frac{1}{2}$ hours of 9-hour shift.

Everyday:

The Challenger drills anywhere, in any position, in any formation... and stays on the job. This particular machine runs 20 hours a day, 6 days a week and averages 540 feet of 3" hole per day. Get complete details on the Junior Challenger from *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



JOY

EQUIPMENT FOR CONSTRUCTION... FOR ALL INDUSTRY



PORTABLE COMPRESSORS



WAGON DRILLS



ROCK DRILL BITS



HAND-HELD ROCK DRILLS

WSW
C6423-145

For more facts, use Reader-Reply Card opposite page 18 and circle No. 275

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Here's real help

for road-building contractors!

Reduce delays—cut costs!





Construction in progress on 10 miles of the new Massachusetts Toll Highway—in Palmer-Chicopee and North Wilbraham, Mass. The Palmer section requires excavation of 2 million

yards of earth and 650 thousand yards of rock. Grandview Construction Corp. of Mt. Vernon, N.Y., contractors for this section, used Gulf petroleum products exclusively on the job.

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how GULF keeps equipment rolling

On the Ohio Turnpike, Gulf was the supplier on 18 of the 45 contracts representing nearly \$81 million out of the total cost of \$193 million. Photo shows section under construction between Strongsville and Olmsted Falls, Ohio, where more than

a million cubic yards of dirt had to be moved. Typical of Gulf service was delivery of 68,000 gallons of diesel fuel in a 20-day period to one 5000-gallon underground storage tank for Peter Kiewit Sons' Company and Condon-Cunningham Company.

It's no
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Gulf p

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Shown under construction here is the only tunnel on the West Virginia Turnpike—a 2-lane tunnel, 2665 feet long with a finished diameter of 36 feet. Work on this part of the job required 25,000 cubic yards of open

cut excavation, 91,800 cubic yards of tunnel excavation, and 20,800 cubic yards of concrete tunnel lining. Bates & Rogers Construction Corporation of Chicago, Illinois, used Gulf petroleum products exclusively.

ing on major highway projects

It's not just coincidence that from Maine to New Mexico...from the Atlantic Ocean to the Rockies...more and more contractors are relying on Gulf petroleum products. That's because:

- Dealing with Gulf, you're sure of prompt delivery. When your equipment arrives at the job, Gulf will be waiting, ready to deliver fuels and lubricants. As long as the job lasts, Gulf will supply you from a nearby bulk plant. Gulf has 1500 strategically located warehouses, so you're sure of an uninterrupted supply of petroleum products—on time!
- Gulf Petro-engineering Service is provided to you on the job...to make sure that you're
- using the most economical and efficient petroleum products for every unit of your equipment. Thirteen hundred Gulf scientists and engineers stand behind your Gulf Sales Engineer to provide technical advice whenever you need it.
- Gulf fuels insure top engine performance. They burn clean and deliver full power.
- Gulf lubricants provide an extra margin of protection to every moving part. With these quality lubricants you'll have fewer mechanical delays, lower maintenance costs and a smoother-running job.

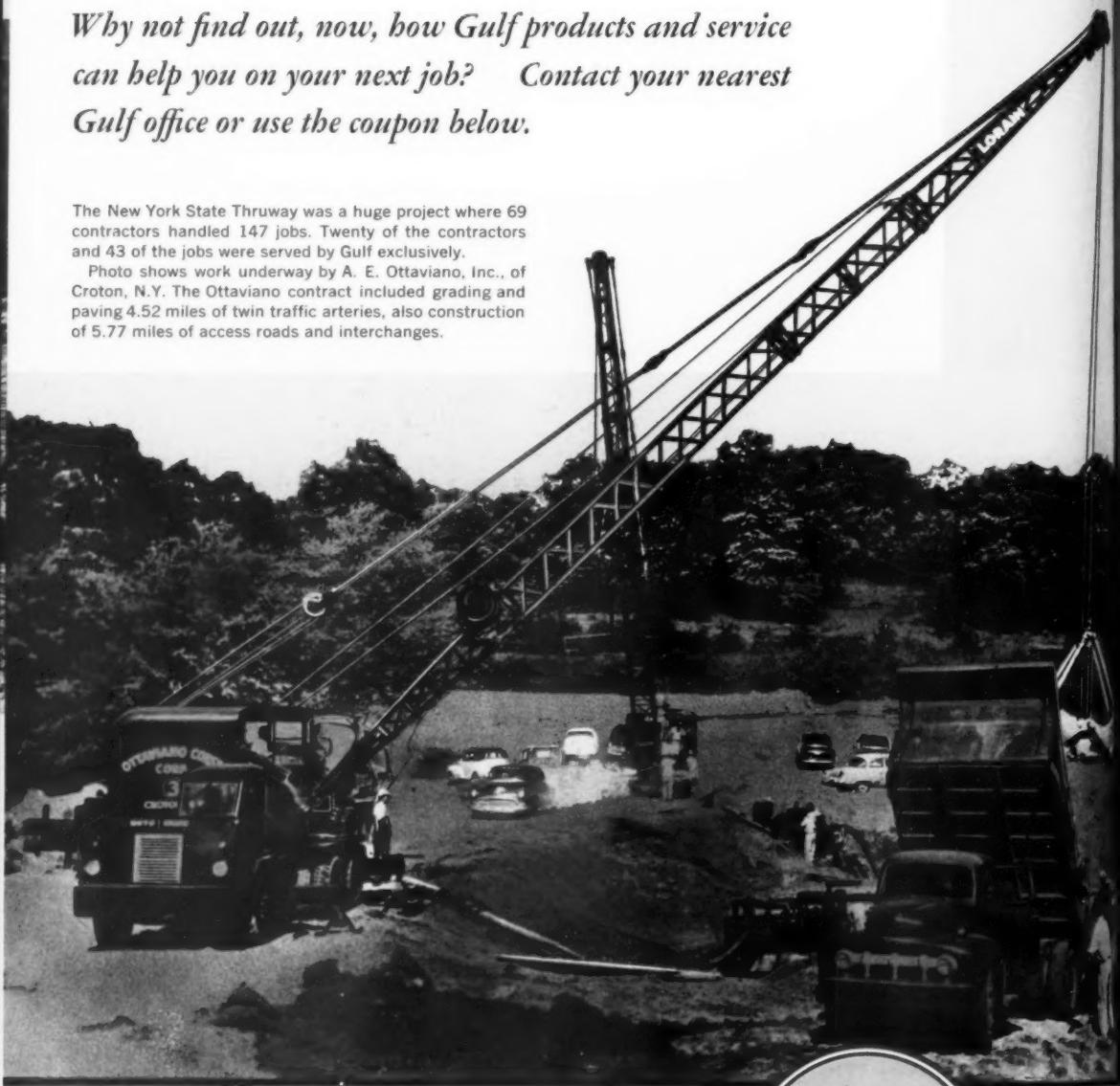
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Why not find out, now, how Gulf products and service can help you on your next job? Contact your nearest Gulf office or use the coupon below.

The New York State Thruway was a huge project where 69 contractors handled 147 jobs. Twenty of the contractors and 43 of the jobs were served by Gulf exclusively.

Photo shows work underway by A. E. Ottaviano, Inc., of Croton, N.Y. The Ottaviano contract included grading and paving 4.52 miles of twin traffic arteries, also construction of 5.77 miles of access roads and interchanges.



Gulf Oil Corporation

1822 Gulf Building, Pittsburgh 30, Penna.

Without any obligation on my part:

- Send me a copy of "Gulf and Your Business."
- Send me a copy of "Contractors Guide" (Lubrication and Maintenance Information).
- Have a Gulf Sales Engineer call on me.

Name _____

Company _____

Street Address _____

City _____ Zone _____ State _____



GULF OIL CORPORATION

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APRIL, 1

details and specifications on this stone can be obtained from the Indiana Limestone Association, Bedford, Ind.

The quantity of cut stone needed has a great deal to do with the total price. Carload or truck lots need not be crated. A small number of individual pieces have to be crated for shipments, and many times the crating and costs are as high as the cost of the stone.

Cut limestone is fragile and allowance must be made for damage in the estimate. When stored outside, it must be placed on wooden blocks that will keep it at least 4 inches above the ground, otherwise it will absorb moisture and stain by capillary action. If advised in time, the manufacturer will provide holes for Lewis pins or anchors, eliminating the need for cutting or drilling the stone on the job site.

Protection of the stone after setting is often overlooked by the estimator. Exposed corners, jambs, sills, corbeled-out belt courses, and ornamental-work should be boxed in strong lumber. If this is not done, the stone may be damaged during the course of the job. Any mortar falling on exposed stone should be removed immediately so that the stone will not be stained.

Limestone must be set in non-staining mortar—either non-staining cement or lime and non-staining waterproof cement. White sand should be used for the best results. The amount of mortar required will vary with the size of the stone and the bed, and joint thickness. Ordinarily, it will require from 4 to 6 cubic feet of mortar per 100 cubic feet of stone.

Granite, marble, slate

Setting granite requires additional labor, as the stone weighs about 200 pounds per cubic foot. Granite cutting is a highly specialized industry and the estimator is wise to rely on subcontract prices.

Most marble is suitable only for interior work, although it can be used on exteriors. In estimating marble, certain practices must be observed. Work on such things as base, cap, stain treads, and floor slabs must be listed and estimated separately. Most marble-setting firms have and use standard subcontract forms which list all the conditions to be met by the contractor. The estimator should read the fine print and note what he is to supply the subcontractor at the contractor's expense. This may include the free use of the hoisting facilities, certain minimum storage areas, and the protection of the work. In some localities, union helpers will be required to handle the marble or stone from unloading cars to the final setting. In other localities, it may be done with common labor.

Another point to watch carefully are stipulations about the concrete fill. Many standard subcontracts will require the general contractor to do such things as furnish and place all the fill and bring up the rough bed

a certain specified distance.

The price of structural slate is influenced by numerous extras—for thicknesses over 2 inches, crating requirements, beveling, rounding corners, fluting, grooving, guttering, honing, nosings, notching, rubbing, and waxing. The estimator should secure company prices based on the particular specification at hand. Marble setters usually handle the setting of structural slate.

Terra cotta, other stone

Terra cotta, a structural clay prod-

uct with a glazed surface, is usually composed of hundreds of pieces of various sizes and shapes. The setting is ordinarily done by brick masons. The estimator should secure prices f. o. b. the job site from several of the recognized manufacturers. Terra cotta is usually supplied in pieces small enough to be handled by hand. If the job size warrants it, the factory will supply an experienced erector to supervise the work at a stated price per day. The mortar required should not usually exceed 5 cubic feet per 100 cubic feet of terra cotta.

Many other kinds of stone for buildings pose similar problems when it comes to making a cost estimate. Each job must be subjected to an operational analysis and a composite price compiled that covers all labor and materials, including those for job overhead, special contingencies, and variable factors. Unless the estimator is thoroughly experienced in the job skills of stone building, he will have difficulty in visualizing all the steps in process.

(Next month's article will deal with "The engineering department—concrete finishing and waterproofing.")



Proven construction worker available **HAS FOUR-YARD SHOVEL...WILL TRAVEL**

Will travel . . . there's the key to the real value of an Allis-Chalmers HD-21G tractor shovel. It not only digs and loads four yards at a pass, it is mobile enough to work in all parts of the excavation . . . and flexible enough to do many different jobs well.

Besides loading trucks, the HD-21G can help maintain haul roads, carry material to stockpiles, clean up stray rock, or even travel ahead of the job to clear land.

Let your Allis-Chalmers dealer show you the many ways an HD-21G can work profitably for you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

For more facts, use Reader-Reply Card opposite page 18 and circle No. 277

Scrapers have uphill fight on earth-fill dam project

The 2,400,000 cubic yards of common excavation required for Hartwell Dam, in the Savannah River Valley between Georgia and South Carolina, is being moved at a rate of 12,000 cubic yards per 10-hour day by the earthwork contractor, M. R. Thomason Co., Montgomery, Ala.

This dam, which will measure almost four miles in length and have a crest width of 20 feet, will rise to an elevation of 679 feet, mean sea level. The water of the Savannah River that it will impound will rise to an elevation of 490 feet.

The earth-fill structure, with a concrete center section and powerhouse, will be the latest multipurpose dam to be constructed in the area under the authority of the U. S. Army Corps of Engineers' Savannah District.

The Thomason firm's big job, awarded under a \$1,480,000 contract, calls for laying the fill, placing impervious red clay in the centerline and pervious materials on the sides of the dam. Under other contracts, riprap will be put down on the upstream side of the embankment. The downstream side will be covered with topsoil and grass to provide for the drainage of the earth fill.

Uphill work

All the fill for the 13,640-foot stretch on the Georgia bank and the 6,200-foot stretch on the South Carolina side is being obtained from borrow pits located in the area to be flooded. This means that almost all the dirt has to be moved uphill to the top of the fill.

This job is being done with four Caterpillar DW21's—three of them with turbocharged engines—and eight DW10's. Three D8 tractors, and one D9, are push-loading the scraper equipment, which is averaging 1,100 loads per day.

But plenty of these days are needed for the project's largest fill, which is taking a total of a million cubic yards of material. As material goes into this 90-foot-high and 500-foot-wide fill, it is being compacted by a Tampo and a Bros 50-ton roller. Each of these is pulled by a Cat D8. As soon as the material has been compacted, a contractor-made scarifier mounted on the rear of a Cat D8, or a Rome disk plow is used to scarify the lift so that the fill material will bond well.

Core trenches subcontracted

Additional drainage on either side of the concrete center section will be provided by core trenches and grouts. Two core trenches, one 35 feet deep and the other 60 feet deep, were subcontracted to Clement Bros. Co., Inc.,

This Caterpillar turbocharged DW21 is one of three such units at Hartwell Dam. As it climbs from the borrow pit to the fill, it passes another scraper on the return trip.



With a Homelite on the Job

Work speeds up... costs go down... always! Because a lightweight, carryable Homelite gives you instant, efficient power any place you need it... power for operating every type of electric tool or bright, flickerless floodlighting. Here, for example, a Homelite gasoline engine driven Dual Purpose generator, operates a standard universal power saw and a one man high cycle concrete vibrator both at the same time. Write for complete bulletin showing many ways to cut time and costs with Homelite Carryable Generators.

HOMELITE

a division of Textron Inc.

5902 RIVERDALE AVENUE • PORT CHESTER, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 278

Cat scrapers loaded by tractors in area, which what will come part of reservoir area, the 1 picks up 1 day.

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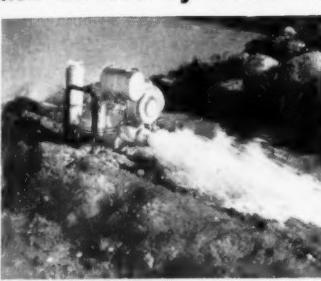
Cat scrapers are push-loaded by Caterpillar tractors in the borrow area, which is located in what will eventually become part of the reservoir area. On an average, the 11-scraper fleet picks up 1,100 loads per day.



Lenoir, N. C., which blasted through about 25,000 cubic yards of low granite. Grout holes were drilled from the bottom of the core trenches, which were filled in with red clay.

Hydraulic drainage sections 5 feet high will drain the downstream side at the base. A section equal to a quarter of the width of the earth-filled portion of the dam, exclusive of the topsoil blanket, will consist of sand. Two 7-foot sections, one of small pebbles and the other of riprap, will follow the sand beneath the topsoil blanket to the edge of the embankment. Stone drainage ditches will carry the drainage water to the river.

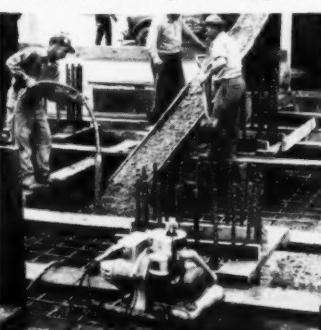
Though Hartwell Dam is mainly intended for the generation of electricity, for water conservation, and for flood prevention purposes, it will also be used to provide a water supply for the city of Hartwell, recreational and fishing facilities for the public, and to help assure a 9-foot channel from Augusta to Savannah on the Savannah River. **THE END**



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".



Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators and 110 volt DC for all universal vibrators, tools and floodlights.

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APRIL, 1957

Transverse dowel joints are stainless-steel clad

■ Non-corrosive stainless-steel-clad dowel transverse joint support assemblies are available from the Acme Highway Products Corp. The free ends of the dowels are covered with a seam-welded stainless-steel jacket which is said to provide a corrosion-proof, air-free, sealed steel dowel. The dowels are then dipped in rust inhibitor to further insure against any oxidation.

For further information write to the Acme Highway Products Corp., 33 Chandler St., Buffalo, N. Y., or use the Request Card that is bound in at page 18. Circle No. 74.

Full Line of Carryable Construction Equipment Now Offered by Homelite

Hydraulic backhoe

■ The Wain-Roy backhoe for Hough Payloader wheel tractors and International crawler units is the subject of a brochure from the manufacturer. The hydraulic unit digs and dumps within a 190-degree arc. Models are available for Payloader Models HU, HH, and HF, and for International Models TD-6, TD-9, and 300.

The bulletin details the nine main features of the backhoe and devotes a section to each of the rigs for which the various models are designed. A page of on-the-job photos show the unit in operation on a variety of construction projects.

Such attachments as moles paw buckets, stabilizer pads, and bell hole buckets are shown, along with specifications on the seven models in the line.

To obtain Form No. 1000 write to the Wain-Roy Corp., Hubbardston, Mass., or use the Request Card at page 18. Circle No. 20.

Open Pa. turnpike section

April 1 marked the opening of a section of the Northeastern extension of the Pennsylvania Turnpike. The 46.6-mile stretch runs from a temporary interchange at Emerald, Lehigh County to the Wyoming Valley Interchange at Dupont, Luzerne County. This includes the mile-long Lehigh Tunnel that goes through the Blue Mountain at Bowmanstown.



for dependable, low-cost hazard warning,

use . . . FLASHER SAFETY LIGHTS

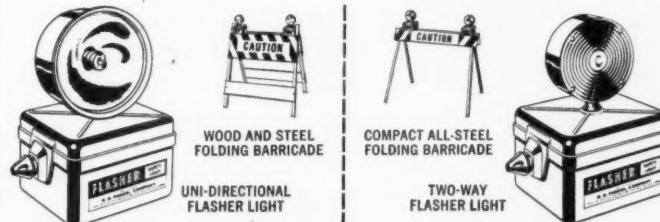
Flasher Safety Lights flash continuously . . . produce brilliant neon flashes, visible over one mile . . . warn passing traffic of hazards, even in rain and high wind! And, Flasher Safety Lights prevent grass and brush fires caused by overturned oil pots . . . eliminate all fire hazards.

Exclusive 8-cell battery-operated Flasher Safety Lights assure low-cost, trouble-free warning

light protection . . . provide up to 90 days of continuous operation without servicing.

Find out how Flasher Safety Lights and Barricades can cut your hazard warning costs. Ask your nearby Fageol Flasher distributor about the money-saving Flasher Light and Barricade rental plan! Or, wire or write the R. D. Fageol Company, Kent, Ohio.

AA-4609



For more facts, use Reader-Reply Card opposite page 18 and circle No. 280

105

This is the first in a series of seven feature articles, each complete in itself, on various aspects of roadbuilding. The articles were written specially for the ROAD SHOW DAILY, published by CONTRACTORS AND ENGINEERS magazine during the 1957 Road Show. They are being reprinted here, by request, for those who missed the Road Show. Each of the articles was written by a key figure in the roadbuilding industry.

by R. D. EVANS, assistant manager, sales development
Caterpillar Tractor Co.

Earthmoving: modern-day bargain

bring "cost-per-yard"

Down to Earth



with...

HENDRIX DRAGLINE BUCKETS

Expert engineering, superior workmanship and the higher quality materials that go into all Hendrix Buckets keep them ON THE JOB ...and they STAY ON THE JOB to move more material at a lower "cost-per-yard."

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 281

A TYPE FOR
EVERY DIGGING PURPOSE

1/4 to 40 Cubic Yards



Two and a half decades ago, earthmoving equipment consisted principally of gas tractors, scrapers, bulldozers and excavating shovels. In contrast today, earthmoving and heavy construction machinery includes diesel tractors—both track-type and wheel-type—diesel and gas trucks, diesel and gas excavators, scrapers, rock and dirt trailers, compactors, compressors, rippers, and various attachments for basic machines used for specialized work in clearing, pioneering and grading.

At no time in history have such vast improvements in design and application techniques in grading equipment taken place as during the nine years since the 1948 Road Show. No longer can the contractor "questionate" his production and submit "today's prices based on yesterday's bids." He must know the production and performance capacity of his men and machines in order to be successful in competitive bidding. In too many cases, bidding is below engineer estimates in spite of higher labor and material costs. Increasing the productivity of labor by making available more powerful, more efficient, more dependable equipment is a partial solution to the rising cost of equipment and labor.

Another reason for the trend to larger, more productive equipment is changing job conditions. The great surge forward in the development of new and more adequate highways has brought with it plans for making cuts and fills through areas that a few short years ago would have been bypassed. The increased emphasis on safety requires that we no longer go over or around an obstruction but through it. Furthermore, our roads are wider, often four or more lanes with adequate shoulders and proper approach lanes.

These highways are expensive, but they are cheap in comparison to what we have already paid in human lives to prove the folly of driving six times as many automobiles twice as fast and ten times as far as our present road system was designed for in the 1920's.

The challenge of the earthmoving contractor today in view of the \$27 billion road program is—"What is the best bargain?"—implying that equipment and management selection must

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**Improvements in the design of earthmovers
and attachments allow contractors to do
bigger, better jobs—successfully**



Earthmoving trains like this one are common on large projects. Here a rubber-tire tractor pulls a scraper being push-loaded by a twin-engine diesel crawler.

be capable of producing the greatest net profit.

Bid prices constant

According to the Bureau of Public Roads, the average bid price has remained relatively constant at about 36 cents over a period of years that has seen machinery prices double and labor costs triple. The reasons for this are many, including the highly competitive nature of the construction business, the ingenuity and aggressiveness of rugged individuals, the improvements in methods and demand for greater equipment performance and new products. In this latter area—new equipment and/or increased performance—the equipment manufacturers have made a substantial contribution.

Grading and excavation methods have been revolutionized since 1929 with the advent of the tractor-drawn scraper and, shortly thereafter, the rubber-tire earthmovers. That era is past, but impressive. Just compare 1948 Road Show equipment with 1957 Road Show equipment.

Explore the improvements of four basic types of grading machines—track-type tractors; wheel-type tractors; motor graders; trailers or truck and shovels.

Although the track-type tractor of 1948 was established as an essential tool of the grading phase, its application in heavy work was limited, including only clearing, pioneering, pulling scrapers, and push-loading. Today, the track-type tractor has "grown-up," added new muscles, and has taken on many new jobs. This additional work is manifold, including more efficient push-loading of scrapers, improved ripping, and brush and rock raking, to mention a few. Even the bulldozer blade has been improved with U-shapes and hydraulic tilt and tip cylinders for greater production.

Productivity of the crawler tractor has been greatly increased since 1948 throughout its many applications. A major step forward since the last Road Show has been the introduction of the large-size tractor with over 300 horsepower and a basic weight in excess of 25 tons. This type machine is making the big jobs move at a faster pace and is handling tasks

(Continued on next page)

For more facts, circle No. 282→



Prescription for Profit...

EUCLID S-12 SCRAPER



with these pay-off advantages

- **CAPACITIES**
12 cu. yds. struck . . . 14 yds. heaped 3:1 . . . 16 yds. at 1:1 slope.
- **EFFICIENT POWER**
218 h.p. with 5-speed transmission is geared to working ranges . . . top speed loaded is over 21 m.p.h. for fast cycle time.
- **MORE TRACTION**
Standard No-Spin differential eliminates wheel spin . . . 26.5 x 25 tires provide extra traction and capacity.
- **HYDRAULIC LEVER ACTION FOR SCRAPER OPERATIONS**
Fast-acting, trouble-free . . . eliminates downtime and expense of cable replacement. All 4 hydraulic jacks are interchangeable.
- **MORE MANEUVERABILITY**
Push-pull 90° full hydraulic steering for non-stop turns in 31 ft.
- **MORE EFFICIENT, LONG-LASTING CUTTING EDGE**
Four sections are reversible and interchangeable for longer life . . . adjustable for most efficient loading in any scraper material.
- **LOWER MAINTENANCE COSTS**
More on the job availability because major components are easily accessible . . . clutch and differential can be replaced in 1/3 the usual time for scrapers; transmission in 1/8 the time.
- **TOPS FOR DEPENDABILITY AND PERFORMANCE**
Pay-off performance proved by contractor preference for "Eucs" . . . the fastest growing line of scrapers in the industry.

See your Euclid dealer
for more facts and figures
and a production cost estimate on the
S-12—you'll find that
Euclids are your best investment.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio



MORE VERSATILITY . . . 13 yd. (struck)
Bottom-Dump is interchangeable with
scraper bowl for flexibility to meet
changing work requirements with minimum
investment in equipment.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





Rubber-tire tractor shovels are important earth-handling rigs; they develop fast speed traveling to and from the job site.

(Continued from preceding page)

that were economically impossible in the past.

The largest crawler of 1948 had approximately 130 drawbar horsepower, compared to today's comparable model of 155 to 160 drawbar horsepower. Although most sizes have had increases of drawbar horsepower of only 10 to 15 per cent, engine horsepower is up considerably more. This power is used for boosting brakes, steering controls and other operating comfort or safety features.

Manufacturers have done much to increase the "on-the-job" availability of machines. Metallurgy has made great advances toward reducing track wear, despite more speed, weight, and horsepower. Steering and master clutches have been completely redesigned with new methods to combat friction.

Optional features

Many options have become available to provide more specialized application of crawlers to special jobs. Choices of speed ranges, starting methods, and sizes and types of track are now offered. The larger machines can be purchased with either direct drive or torque-converter drive, depending on application and preference.

Another economical advantage of these big crawlers is their ability to rip many soils for efficient scraper loading which previously had to be drilled, blasted, and shovel loaded. And now, with rippers mounted on the tractors, the rippers can employ the weight of the tractor for penetration, and then can be raised out of the way, allowing the tractor to maneuver effectively to handle other jobs.

During the time of the last Road Show, wheel tractor-scaper combinations were generally limited to long-haul assignments. They were considered a specialized tool lacking traction and gradability, especially in adverse conditions. In many cases they were overlooked in favor of the self-loading crawler tractor-scaper combination, frequently even where job conditions were favorable to speed.

Today "big rubber" has become the heart of the excavating-grading phase of construction. Jobs are now dependent on fleets of rubber-tire machines that run in well-managed cycles at high speed. Track-type tractors are now kept busy at push-load-

ing exclusively. Tandem pushing has even been used advantageously for loading in some conditions.

Because there has been a definite need for both two-wheel and four-wheel tractors, major advancements have been made in both. Besides the various improvements in operator comfort and safety, these machines can boast up to 50 per cent more horsepower since 1948. The development of the turbocharger was instrumental in making higher, more efficient power available.

Again, improvements in metallurgy

and welding and the introduction of tubeless tires are keeping these machines on the job longer than ever before.

Much has been done to speed the loadability of the scraper in the last few years. The modern scraper design is wider, lower, and longer to provide faster loading and less lifting of the material. All this adds up to wide acceptance of today's wheel tractor-scaper as the high production tool in medium-to-long-haul earthmoving. Many of these modern rigs are moving more than 2,000

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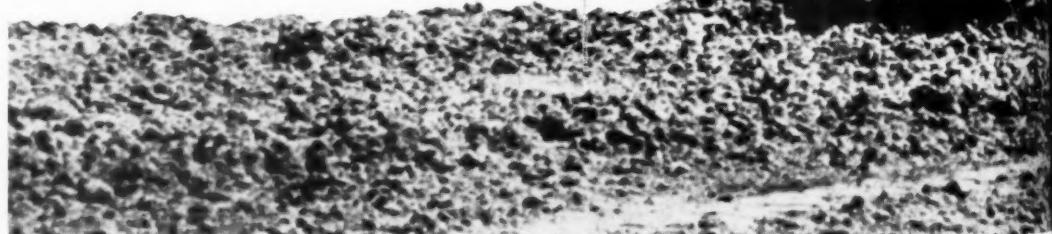
For the production you need on

go **GarWood**

- Today's "big" jobs demand equipment that can produce to tight schedules. On jobs like this, Gar Wood equipment is proving its ability to reach and maintain higher levels of production on schedule!

Gar Wood's high productivity is no accident. From the ground up, all Gar Wood equipment is designed and built for fast, smooth operation under full-load conditions. Whether your work calls for construction machinery or truck equipment, you can "go Gar Wood" and get more production! Contact your Gar Wood dealer, or write direct to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

Gar Wood - St. Paul offers a complete line of dump bodies to meet your exact capacity requirements. Bodies have integrally-welded corner posts, running boards and full-width rear apron . . . can't warp or spread under big payloads. When matched with famous "Strong-Arm" hoists, dumping is fast, safe . . . even on slopes. "Strong-Arm" design eliminates one-sided lifting strains!



GAR WOOD INDUSTRIES, INC.

PLANTS IN WAYNE AND YPSILANTI, MICH.; FINDLAY, OHIO;

CONTRACTORS AND ENGINEERS

MATTO

APRIL,



Where the going is rough, a scraper may be pulled by a crawler tractor and push-loaded by another crawler with a dozer blade, as in this scene.

Congratulations on today's big jobs



INC. Wayne, Michigan

MATTOON, ILL.; RICHMOND, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 283

APRIL, 1957

cubic yards per 8-hour shift under average conditions, whereas machines of 1948 were producing only 60 to 75 per cent of that figure under similar conditions. Except in traction conditions that limit its use, the wheel tractor-scraper is an essential tool for keeping grading costs in line.

Motor graders grown, too

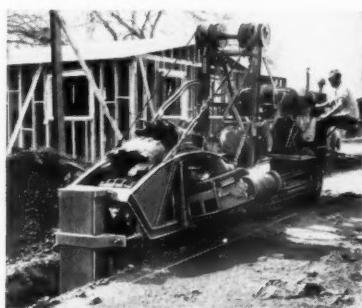
Just before the last Road Show, the motor grader grew to 100 horsepower. Today its most accepted size is 15 to 20 per cent above that. In addition, operator comfort and machine dependability have been improved and great strides have been taken in new attachments.

New versatility has been added to the motor grader because of these attachments. A good example of this

is the elevating grader, a modern refinement of the old pull-type machine, which can now be mounted as an integral part of the grader.

Certainly one of the most spectacular attachments to appear since 1948 is the automatic blade leveler. This device will hold the blade to a predetermined grade against terrain irregularities and will cut most of the time and guesswork from finish grading.

Rear-dump trucks and bottom-dump and rock wagons have a place in many phases of construction where top loading is most practicable. The shovel and dragline fit naturally where rock and similar materials are



Gar Wood-Buckeye ditchers are real production machines. Efficient transmission of power insures maximum power at the digging wheel. And, this power is easier to control in a Buckeye! Hydraulic wheel hoist and hydraulic conveyor drive are instantly operated from seat by simple, one-hand controls. No complicated shifting, no need to stop digging wheel or crawlers.



Gar Wood 3/4-yard excavators pay off in many "high-output" features. Positive, independent chain crowd on the 75B puts full engine power into every bite. Independent travel means operator can hoist or swing while moving. Dependable production is insured by heavy-duty conical-hook double rollers and flame-hardened gears and shafts.



Gar Wood-Buckeye Hi-Way Widener dig clean, flat-bottomed ditch. Excellent uniformity of width and depth of cut eliminates later finegrading. Fast, accurate control makes it easy to hold desired grade. Conveyor discharges spoil to either side, clear of widened ditch. Owners report digging up to a mile of clean side ditch per day!



The motor grader takes over after a fill has been brought to rough grade by hauling units.

encountered. In 1948, the principal sizes in heavy construction were 1½ and 2-yard machines, loading out haul units in capacities from 12 to 18 tons.

Increased horsepower available for hauling units after 1948 provided capacity in units up to 50 tons—20 to 25 tons in single axle units, 32 to 35 tons in dual-axle, and similar capacities in wagons and trailed units.

At this point, it is well to consider the ever important phase of "sizing" loading equipment to hauling equipment. A common denominator has not been determined, as it is largely a matter of economics and involves many factors. To the grading or earthmoving contractor the basis for size can be summed up in the rule of thumb: a maximum of four or five passes to the load. To meet this rule shovels and draglines in sizes of 3, 4, and 5 yards and larger are required and are available to load the present haul units. Besides diesel power, diesel electric units have proven successful.

Belt loaders provide another method of loading dirt to meet the increased loading demand for proper "sizing." Outputs from 600 to 1,200 cubic yards per hour have been realized by these units.

Major improvements in shovels are found in extensive use of alloy steels to give greater strength with less weight, simplified and improved power-actuated controls, increased operator comfort, and torque converter, meaning better performance.

In trucks and trailed units, increased horsepower, better use of high-strength steels, torque converter and automatic transmissions, better flotation, tubeless tires, increased speeds, and operator comfort have contributed to better performance and decreased grading costs.

Although this discussion has con-

sidered only four types of grading machines, there has been extensive redesign and improvement in tractor shovels, compactors and other tools used in this phase of construction.

Despite the fact that the initial investment and operating costs of today's grading equipment have climbed, the over-all productivity has more than kept pace.

When selected and managed properly, the grading machines seen at this Road Show will all give "more for the money" than their counterparts of 1948. The combination of this equipment and talented contractor management not only makes today's grading jobs a bargain for the American public, but has opened up a frontier of new projects for better living.

THE END

CONTRACTORS! Getting new construction business takes plenty of smart digging. And Dodge Reports tell you where to dig. In short . . .



The Choke-Master hydraulic telescoping boom attachment is interchangeable with other attachments for Quick-Way shovel-crane.

Telescoping attachment now available for crane

■ The Quick-Way Choke-Master, a new hydraulic reaching, grading and digging attachment for shovel-crane, has been announced by the "Quick-Way" Truck Shovel Co. The attachment is a telescoping boom which mounts on a special gantry and is interchangeable with other standard attachments on Quick-Way rigs.

The telescoping action is operated by a large hydraulic cylinder. A second hydraulic ram opens and closes the bucket with a wrist action. A hydraulic motor rotates the bucket 50 degrees in either direction on the end of the boom.

The boom extends 33 feet with the bucket open, or telescopes to 21 feet. The boom can be raised to an angle of 45 degrees, enabling the Choke-Master to grade slopes as high as 27 feet. A digging depth of 13 feet is also possible.

For further information write to the "Quick-Way" Truck Shovel Co., 2401 E. 40th Ave., Denver 1, Colo., or use the Request Card at page 18. Circle No. 37.

Fluid power equipment

A bulletin from the Kalamazoo Division of The New York Air Brake Co. details the Hydrex line of fluid power equipment for earthmoving and material-handling rigs. Included in the line are hydraulic pumps, fluid motors, control valves, and cylinders.

Hydrex gear-type pumps are available with maximum ratings of 110 gpm and a maximum recommended operating pressure of 1,500 psi. Dual-Vane pumps deliver up to 59 gpm at a continuous pressure of 2,000 psi. Gear-type fluid motors are available to deliver up to 17 horsepower at 1,000 psi. Dual-Vane motors will deliver up to 120 horsepower at 2,000 psi, continuous.

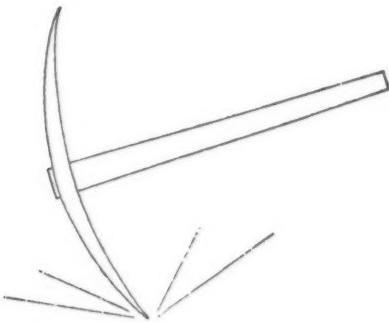
Control valves are manufactured in capacities of up to 100 gpm. The hydraulic cylinders are available in single-acting, double-acting, and telescopic models in standard and custom designs with strokes to more than 20 feet.

To obtain this bulletin write to the Kalamazoo Division of The New York Air Brake Co., 9000 E. Michigan, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 25.

Hints to machinery buyers

■ How to get the most for your investment dollar in heavy machinery is the theme of a new booklet from the Caterpillar Tractor Co. "Lowest and Best Bid" shows the points that a prospective buyer should consider in evaluating the real costs of owning and operating construction machinery. The booklet emphasizes the importance of costs-per-hour through charts comparing machines actually in operation on the job.

To obtain Form No. 32323 write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 16.



We can help you "dig up" business!

Put down the pick—and pick up your pen if you want to know about new construction jobs coming up in your area . . . and how to get invited to bid on just the kind of work you want. Read, fill out and mail this coupon today!

TO: DODGE REPORTS, 119 WEST 40TH STREET, DEPT. 72, NEW YORK 18, N.Y.

Yes! I'd like to pin-point my prospects by knowing in advance who's going to build, what, when, where.

I want to know whom to contact and when to submit bids.

I'd like to see some Dodge Reports, and I'd like a copy of your booklet that tells how to use this accurate, daily, up-to-the-minute construction news service to get profitable business.

I understand that I can pick just the area and type of construction activity that interests me. Also, that I won't have to wade through mounds of data to find the information I need.

I'm interested in General Building House Construction Engineering (Heavy Construction)

in the Following Area: _____

NAME: _____

ADDRESS: _____

CITY: _____ ZONE: _____ STATE: _____



For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 284

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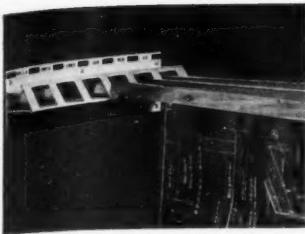
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The E. Z. Way blueprint rack attaches easily to any surface and provides a flexible, instantly expandable filing system.

Aluminum blueprint rack is compact, lightweight

A new type of blueprint rack for architects, engineers, and job superintendents is available from the Blueprint Rack Co. The E. Z. Way blueprint rack attaches easily to walls, in corners, or on columns. It is recommended for use especially where space is at a premium.

The rack is made of $\frac{1}{8} \times 1/16$ -inch aluminum extrusions and is finished with satin aluminate. Blueprints hang vertically from the sticks which pull out of the rack quickly and easily. There are no moving parts, and the cantilever design is said to be trouble-free. Mounted side by side in multiple units, E. Z. Way racks provide a flexible, instantly expandable blueprint filing system, the manufacturer states.

For further information write to the Blueprint Rack Co., 10033 Sierra Ave., Fontana, Calif., or use the Request Card at page 18. Circle No. 34.

Manual wrench multiplies applied torque 20 times

A manually operated impact wrench with the ability to deliver torque values up to 20 times that applied to the handle by the operator has been developed by the Swenson Engineering Co. The Swench is said to be the first hand-powered tool incorporating the impact principle. It is operated like a ratchet wrench.

With the Swench, a single operator



The Swench impact wrench.

can manually tighten to practical tensions bolts up to $1\frac{1}{4}$ inches in diameter. As the impact force can be controlled through a simple spring setting, any desired bolt tension can be produced by the operator through control of the impact force and the number of impacts applied to the fastening.

The Swench is available in three models. Model 500 fits $1\frac{1}{2}$ -inch sockets and takes a range of bolts through $\frac{3}{4}$ inch. Model 750 fits standard $\frac{3}{4}$ -inch sockets and takes bolts from $\frac{1}{2}$ to $1\frac{1}{4}$ inches. Model 1000 is designed for 1-inch sockets and accommodates bolts up to $1\frac{3}{4}$ inches.

For further information write to the Swenson Engineering Co., P. O. Box 43, Branford, Conn., or use the Request Card at page 18. Circle No. 33.

WORKING AT AN ELEVATION OF 6,170 FEET ABOVE SEA level, this Eveready Model E-15 self-propelled concrete saw is being used by the Whisenant Construction Co. on a job at Peterson Air Field near Colorado Springs, Colo., involving the removal of approximately 4,000 square yards of slightly deteriorated concrete. Equipped with Eveready's Powr-Drive, which provides speeds up to 12 fpm, the saw cuts an inch deep around the deteriorated areas. The concrete is then chipped off down to the good concrete, which is used as the base for pouring new concrete to bring the thickness of the slab up to specifications. To do the job, the Model E-15 is using Eveready diamond blade specification Ready-Cut 6. For more information circle No. 47 on the Request Card at page 18 or write to the Eveready BrikSaw Co., 1509 S. Michigan Blvd., Chicago 5, Ill.



The Right Size and Type Rear Dump

for every tough off-highway job!



34-ton capacity PR21 - DW21, for maneuverability in tight quarters.



PR15 - DW15 — fastest, toughest hauler in the 22-ton capacity class.



34-ton capacity PR20 - DW20, for long hauls, high speeds.



New 31-ton Athey Hydraulic Ejection Trailer handles sticky, hard-to-discharge materials.

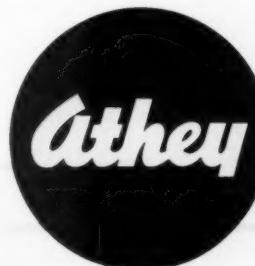


Name the materials you handle — Rock or earth — there's an Athey Trailer designed specifically for handling them faster and cheaper than ever before.

Name the tough jobs that beat up haulers — Fast, tough hauls, sloppy footing, big rock, tight quarters — that's the job for an Athey Trailer!

You make your selections from the only complete and proved trailer line. Select the exact size and features to gear your haul unit to your job. You can depend on them — each Athey Trailer is built to highest standards of quality, design and construction. And Athey Trailers set the pace for lower cost, fast dumping, greater maneuverability, easier loading and higher production.

Ask your Athey-Caterpillar Dealer for all the facts on the complete line of quality-built Athey products today — he will gladly help you select exactly the right Athey-Caterpillar hauling unit for your off-highway job. Or write us for literature. **ATHHEY PRODUCTS CORPORATION, 5631 West 65th Street, Chicago 38, Ill.**



THE Complete TRAILER LINE... by the Leader

For more facts, use Reader-Reply Card opposite page 18 and circle No. 285



Leading the spread, a Caterpillar No. 12 motor grader with Roadgrader Gauge Corp. blade extensions trims the 25-foot lane. The extensions, supported on a wheel attachment riding the completed pavements, can also ride 10-inch forms.

Three finishers make single pass to keep up with pavers; big plant supplies multi-paver spread with 1,600 batches daily

by ANTHONY N. MAVROUDIS,
field editor

Three pavers set swift tempo for extension job on concrete runway



The lead paver works between the forms, the other two outside the forms, dumping concrete to the Blaw-Knox spreader. Each of the Blaw-Knox finishers, making one pass each, works up tight against the spreader.



Just behind the third machine, a Koehring longitudinal float smooths out any ridges that may be left after the transverse finishers move by.



A Hiltzel Flex-Plane cuts a 2½-inch-deep longitudinal center joint. The workman at front places steel fillers in this joint; the two at the rear place steel fillers for the transverse contraction joints.



After the hand-finishing operation, this contractor-built rig rolls along, allowing workmen to pick up the steel fillers. The machine supports burlap drags.

Using three pavers, C. J. Langenfelder & Son, Inc., Baltimore, Md., was able to place 2,800 linear feet of 25-foot-wide, 10-inch-thick unreinforced concrete runway lanes every 10 hours at Patuxent River Naval Air Station, Maryland.

This production on the \$4 million U. S. Navy Bureau of Yards and Docks runway extension project was aided by an efficient batch plant setup, capable of turning out more than 1,600 batches every work day. This supplied the fast multi-paver spread for the two runway extensions.

One of the extensions, running in a northeasterly direction from an intersection with the north-south runway, was extended about 3,000 feet to bring the runway to a length of 6,400 feet. The north-south runway was also extended about 3,000 feet to a length of 6,240 feet.

Asphaltic-concrete cushion

Before pavers placed any concrete for the 300-foot-wide runways, American Asphalt Products Co., Washington, D. C., laid 110,500 tons of asphaltic-concrete over the existing 8-inch-thick runway to form a cushion for the new 10-inch slab. This cushion varied in thickness from 2 to 18 inches, 2 inches being held as a minimum to assure the new pavements of proper drainage.

American Asphalt used a Blaw-Knox rubber-tire paver spreader, having a paving width of 12 feet, to place the asphalt cushion in maximum lifts of 3 inches. Compaction was handled by two double-axle tandem rollers, together with a triple-

axle tandem. Beyond the existing runways, the subgrade was built up and compacted to support the extensions.

Langenfelder used about 8,000 linear feet of keyed Blaw-Knox steel forms for the job, keeping 4,000 feet of forms in place ahead of the pavers at all times.

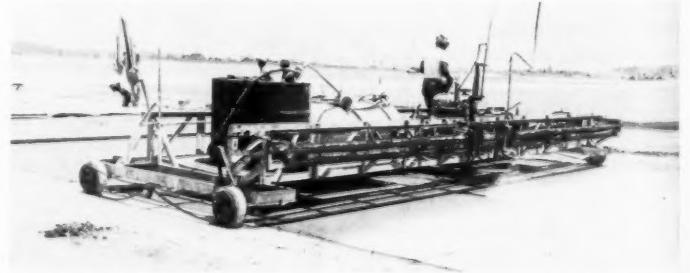
The keyed forms were used to get an interlocking action between adjacent 25-foot lanes. Once the first 25-foot lane for a runway had been completed, the contractor used only a single line of forms for the remaining lanes.

The preparation of the form trench and the driving of the form stakes was handled manually, but an Ingersoll-Rand pin puller was used to remove the form stakes.

This equipment was almost a necessity on the job if the forms were to be kept moving ahead of the paving train.

Riding between the forms and the completed lane, a Caterpillar No. 12 motor grader with grade blade extensions made by the Roadgrader Gauge Corp., Wilmington, Del., cut and trimmed the grade ahead of the concrete paving spread. The blade extensions, making it possible for the grader to cover the entire 25-foot width of a lane, were set and adjusted for the 10-inch forms. At either end, the blade extensions were supported by a wheel attachment that rode on either the steel forms or two completed pavements. The grader operator merely dropped the blade until the end-wheel attachments came to rest on either forms or slabs.

A Buffalo-Springfield 10-ton, three-wheel roller, pulling a Cleveland Trailgrader, followed the grader to



A Hiltzel Flex-Plane spray machine, the last in the train, sprays a white-pigmented compound on the concrete so that forms can be stripped after 24 hours.

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APRIL, 1

A batch truck picks up cement from a Blaw-Knox silo while another truck delivers the material to the 61-foot-high enclosed elevator leading to either the 600-barrel silo or the hopper. The hopper has a twin batcher for simultaneous loading of the two-batch-capacity trucks.



give a final compaction to the sub-grade before the pavers came along.

The first paver in line worked between the forms, while the other two pavers operated from the grade just outside the forms. All three pavers discharged batches in front of a Blaw-Knox spreader.

As the spreader moved ahead, its two rear-mounted vibrators, working close to the forms, consolidated the concrete mix in and around the keys of the forms and slab.

Each of the three pavers was supplied with water by two 2,000-gallon water trucks and with concrete by a fleet of 24 Chevrolet and Ford batch trucks, each with a two-batch capacity.

Three Blaw-Knox double-screed transverse finishing machines were used behind the spreader to keep the paving train running smoothly. In instances when less than three finishers were used, the machines had to make more than one pass over the concrete being placed. Enough time was consumed in making the second pass to put the three pavers far ahead and leave a wide gap between the spreader and the finishers. When this happened, the concrete lost some of its workability and slowed up finishing operations even more. After some experiences like this, the contractor adopted the rule that each paver in the spread be matched by a finishing machine. In this way, each finisher was able to make a single pass over the concrete and keep up with the fast-moving spreader and pavers.

Only one Koehring longitudinal float was needed to keep up with the train. It worked behind the finishers and ahead of the Heltzel Flex-Plane that cut a 2½-inch-deep longitudinal center joint and formed transverse joints. The Flex-Plane, driven by a Wisconsin engine, carried three men. Two rode a rear platform and placed 2½-inch-deep steel fillers every 15 feet to form the transverse contraction joints. One man operated the machine and also placed steel fillers for the longitudinal joint. Workmen followed to hand-finish the concrete surface with Heltzel hand lutes.

Following the hand-finishing operations was a self-propelled, contractor-built machine that picked up the longitudinal steel fillers and supported burlap drags attached to the front and rear platforms of the machine.

A Heltzel Flex-Plane spray machine, the last rig in the paving train.

(Concluded on next page)



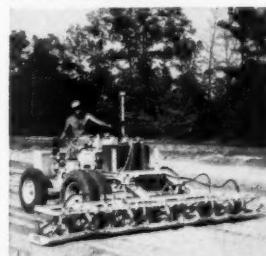
A FAR MORE POWERFUL, FASTER AND EFFICIENT JACKSON VIBRATORY COMPACTOR

Combines all the versatility and wide adaptability features* that contributed to making the present JACKSON VIBRATORY COMPACTOR the predominant compacting medium on nearly all major paving projects! By all means get the complete facts concerning this new machine before making any commitments! Write today for literature which will soon be available!

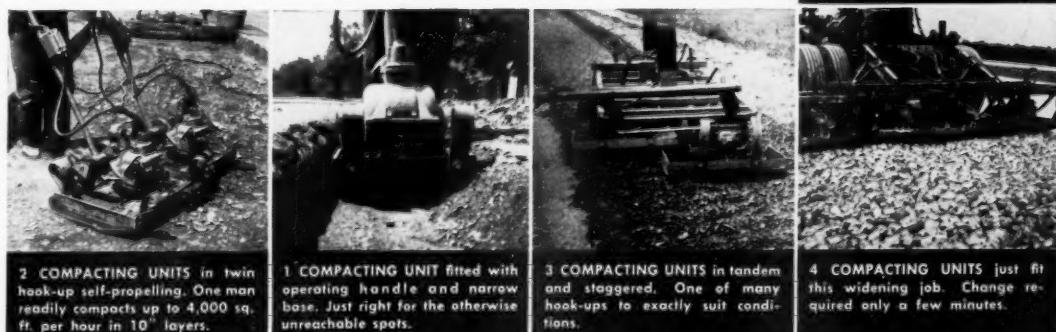
There are more Jackson Vibratory Compactors in use than all other makes of pan-type compactors combined.

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LUDINGTON MICHIGAN

* ADAPTABILITY FEATURES OF PRESENT JACKSON COMPACTOR WHICH WILL ALSO CHARACTERIZE THE NEW MACHINE.



6 COMPACTING UNITS in work-head for maximum coverage.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 286



The steady stream of trucks at the drive-through plant keeps three cranes busy charging the Blaw-Knox aggregate bin from three pairs of stockpiles. Workmen keep the stockpiles completely saturated with water so that the water content of the mixes can be determined.

sprayed a white-pigmented curing compound transversely across the slab as the machine moved ahead. This made it possible for forms to be stripped after 24 hours.

Manu-Mine Research & Development Co., Reading, Pa., which handled the joint-sealing job, used a Clipper joint sealer to force an asphaltic filler in the longitudinal and transverse contraction joints. Expansion joints, spaced every 225 feet, were formed by commercial board fillers supported on wire chairs so that paving operations were not interrupted.

The forms stripped with the Ingersoll-Rand pin puller were picked up by a Lorain truck-crane and loaded

to a Mack low-bed trailer to be hauled ahead of the pavers.

Batch plant operations

The fast-moving paving train was fed by a centrally located batch plant consisting of Blaw-Knox cement silos and aggregate bin set up for drive-through loading.

Aggregates, delivered by scows from Sparrows Point, Md., were transferred to dump trucks for the haul to the batch plant site. Two sizes of combined coarse aggregate and crushed slag, and sand were stockpiled. Six stockpiles, a pair for each material, were maintained so that newly delivered aggregates could be watered for 24 hours before they were used.

All six piles were kept saturated, 24 hours a day, so that evaporation would not take place from the surface to the core of the stockpiles and make it difficult to determine the exact amount of water content in the mixes.

Langenfelder used three cranes—one for each pair of stockpiles—to load the three 35-ton compartments of the aggregate bin. Each of the cranes, equipped with an Owen 2-yard rehandling bucket, was kept busy keeping the compartments full since a constant stream of batch trucks kept the plant operating at top speed.

After being weighed by a Thurman scale, the sand, crushed No. 6 slag with $\frac{3}{4}$ -inch maximum stone and crushed No. 2 slag with 2-inch maximum stone were dumped by an air and electric release into waiting batch trucks. The trucks received 1,775 pounds of sand, 960 pounds of No. 2 slag, and 1,200 pounds of No. 6 slag per batch before driving over to the cement bin, where 837 pounds of cement was added to each batch. An air-entraining agent was also added to each batch at the cement silo.

The Blaw-Knox cement bin was equipped with twin batchers for the simultaneous loading of the two-batch-capacity trucks. The cement was weighed, again by a Thurman scale, and dumped into the cement hoppers of the batch trucks by air and electric releases.

Cement delivered to a railroad siding about a mile from the plant was brought to the cement silo by dump trucks. Arriving at the cement silo, the trucks backed up an earth ramp and end-dumped into a hopper that fed a screw conveyor. An enclosed bucket elevator, 61 feet high, raised the cement to either the 600-barrel storage silo or the 600-barrel hopper. Air was supplied to the cement and aggregate bins by a portable Jaeger 185 air compressor located between the bins.

Personnel

John Woolfolk was the general superintendent; R. C. Mathern, the paving superintendent; Hanse Lamberson, the plant foreman; and A. M. Sauter, the concrete foreman for Langenfelder. The Bureau of Yards and Docks engaged Froehling & Robertson, Inc., Richmond, Va., consulting engineering firm, to perform the required inspection.

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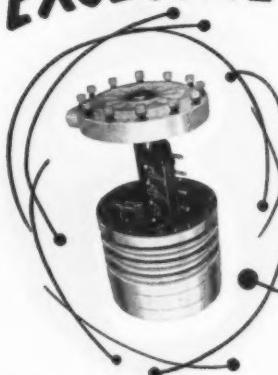
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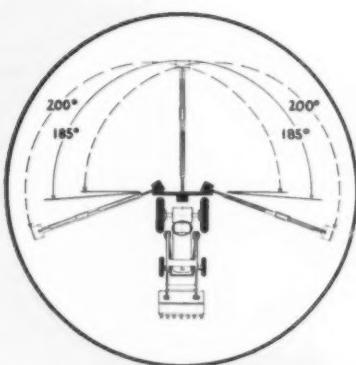


NEW HYDRAULIC ROTARY BOOM SWING CYLINDER



**DISCOVER
DAVIS**

**...AND WHY IT WILL DO WHAT
NO OTHER BACK-HOE CAN DO!**



**PROVIDES 200° CONTINUOUS
OPERATING ARC**

This diagram illustrates the degrees of continuous operating arc from each of the three mounting locations—200° when side mounted, or 185° center mounted. Has no pins to change or cable to break.

**Davis Back-hoes and Loaders are sold and serviced
everywhere in the U.S.A. and Canada by better dealers!**



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 287



The Davis pipe coupling machine is made in various sizes for installing most pressure-type joints in cement-asbestos, concrete, clay, or cast-iron pipe 6 through 16 inches in diameter.

New pipe coupling machine for pressure-type joints

Easier, faster pipe installations are said to be possible with a new pipe coupling machine available from the Davis Mfg. Co. The new rig is made in various sizes for installing most pressure-type joints in cement-asbestos, concrete, clay, or cast-iron pipe 6 through 16 inches in diameter.

The new machine eliminates chains and tedious hand assembly. It has an easy-grip handle that is pulled to make a coupling and pushed to uncouple. Both operations can be done without removing or resetting the unit.

For further information write to the Davis Mfg. Co., 10th and Gentry, N. Kansas City, Mo., or use the Request card at page 18. Circle No. 29.

Use of rock bolts shown in mining safety film

"Make Mine Safety", a new 16 mm sound-color film demonstrating the use of rock bolts in mining, is available from the Colorado Fuel & Iron Corp., Denver, Colo. The film shows the installation of rock bolts at three representative mines, and also shows the production of rock bolts at the corporation's Pueblo, Colo., plant.

Showing actual mine situations as well as explanatory diagrams, the film demonstrates how the use of rock bolts can give added safety when used as a substitute for, or in conjunction with, conventional methods of timbering, roof supports, and reinforcements. While the subject of the film is mining, it should be of interest to tunnel workers as well as to miners and mining engineers.

Standard Steel appoints

Harry C. Hamilton has been appointed Midwestern regional sales manager for Standard Steel Corp., Los Angeles, Calif. Hamilton, who will make his headquarters in Indianapolis, Ind., will cover North and South Dakota, Iowa, Nebraska, Kansas, Missouri, Oklahoma, Arkansas, Minnesota, Wisconsin, and Illinois, and the Canadian provinces of Saskatchewan and Manitoba.

APRIL, 1957

Welder-generator's power increased by larger engine

A gasoline-driven welder that provides electric current instead of or in addition to welding current is now available with a larger engine for increased output. The Miller Electric Mfg. Co.'s Model AEA-200-L is now equipped with a 12.9-hp engine that enables it to produce 225 amps of continuous-rated high-cycle welding current or 5 kw of 110 to 220-volt ac power for operating electric-motor-driven tools. One kw of 110-volt dc



The Miller Model AEA-200-L.

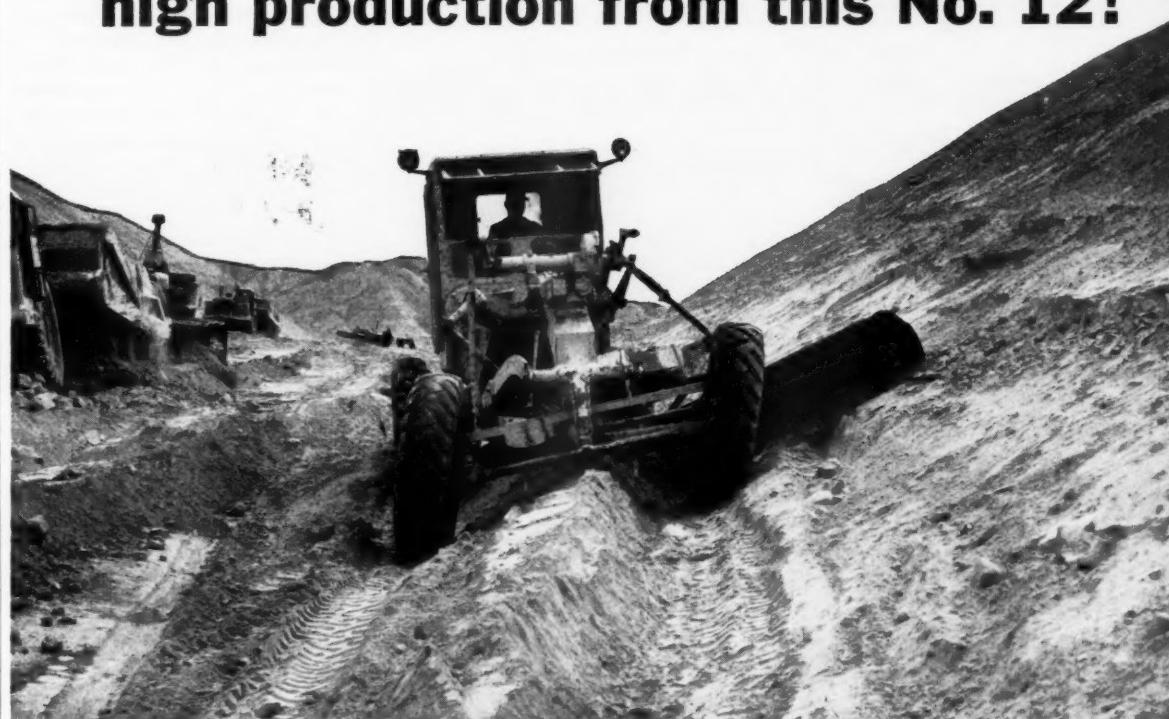
power is available while welding.

For further information write to the Miller Electric Mfg. Co., 718 S. Bounds St., Appleton, Wis., or use the Request Card at page 18. Circle No. 58.

C. I. T. appoints two

C. I. T. Corp., New York, N. Y., has appointed Harold E. Tacker and B. J. McNabb to its Texas office. Tacker will represent the company in western Texas and McNabb will cover the eastern half of Dallas county.

Why Mr. Thorn expects and gets high production from this No. 12!



Besides bank sloping, this Cat No. 12 Motor Grader maintains haul roads for DW21s and DW10s on the 9.2-mile realignment of U. S. 91 near Mesquite, Nevada. Note D8 in background.



PAUL A. THORN

"We have owned Caterpillar products since 1927," says Paul A. Thorn, President of Thorn Construction Co., Inc., Springville, Utah. "We're firm believers in them because of economy, minimum down time, long life and constant engineering improvement. We also think that Caterpillar Dealer service is in a class by itself."

Speaking from 29 years of successful experience, Mr. Thorn now has a Caterpillar line-up that includes thirteen D8s, five DW21s, two DW10s, seven Diesel Engines, one Diesel Electric Set and six No. 12s. This No. 12, with 9999 hours on its hour meter, was part of the company's rugged yellow team on a 9.2-mile realignment of U. S. Highway 91. The contract involved moving 1,500,000 cu. yd. of dirt. Working 10 hours a day, 5 days a week, the No. 12 contributed its full share to money-making production.

Now an even more productive CAT* No. 12 Motor Grader

As good a machine as this "old" No. 12 has proved itself, there's even more work at lower cost with less down time built into the new No. 12. Constant engineering improve-

ment is the reason. For example, the new No. 12 has an exclusive oil clutch that can operate up to 1500 hours without adjustment. New tubeless tires, now standard, save time and money by eliminating an estimated 80% of down time due to tube and flap repair and by providing longer tire life. These and other features add up to a new standard of grader performance!

Another point well worth considering: your Caterpillar Dealer backs you with prompt service whenever and wherever you need it. He has the trained mechanics and parts to do the job fast and right. See him for complete facts about the practical, advance-design features of the No. 12. Name the date—he'll be glad to demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

99% OF ALL
CAT MOTOR GRADERS
ARE STILL IN USE



A Cat D6 tractor continues compaction work with a LeTourneau sheepsfoot roller as more material is added to the fill by a Euclid bottom-dump. Fill required for the job came to a total of 550,000 yards.

Grading and paving bring new thruway link to completion

Work done simultaneously on stretches of north-south link between George Washington Bridge and N. Y. State Thruway

Case History #139

Ridgewood, New Jersey, Contractor Reports:

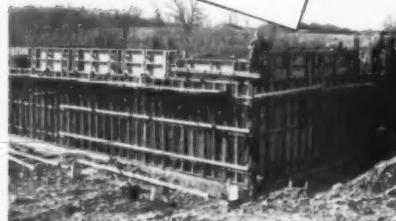
"CONCRETE FORM ERECTION COSTS CUT 47% WITH ROCFORM SYSTEMS"

10
HUGE REASONS
WHY
ROCFORM
SYSTEMS
CAN CUT
YOUR
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COSTS!

- All metal walers
- All hardware is guaranteed and replaced without charge when necessary
- No snapts
- Eliminates 90% of standard bracing and strongbacking
- Reduces erection costs as much as 50%
- Gives up to 300 pours and more before reconditioning is required
- Patented clamping device eliminates nailing
- Extreme versatility makes Rocform Systems easily adaptable to any concrete forming job
- Reusable, heavy-duty tie rods
- Extreme handling ease reduces labor costs to an absolute minimum

Sites on the erection of Nike Sites, for the United States Government under the direction of the Corps of Engineers, U. S. Army. We were able to reduce our erection costs by 47% less than they formerly were when we used a less advanced forming method that employed snapts, 4' x 8' panels, and 2 x 4', 2 x 6 walers, strongbacks, etc. In addition to these savings, Rocform Systems eliminate 90% of standard bracing, strongbacking and all tie rod and hardware expense. These savings aid us materially in obtaining new construction jobs.

Yours very truly,
Peter J. Soldano
Peter J. Soldano



Exterior view of Rocform Systems as used in the construction of "Nike Sites" at Springvalley, New York. Note total absence of bracing timbers, strongbacking and wood walers.

write, wire or call
NOW!

Get all the facts on Rocform's Easy Payment Plan, Free Engineering Counsel and additional mechanical advantages which make Rocform Systems the world's most advanced and economical concrete forming method.

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WORLD'S LEADING PRODUCER OF CONCRETE FORMS

IMPORTANT!

Rocform Systems can be used with equal ease for Commercial, Industrial or Residential work.

For more facts, use Reader-Reply Card opposite page 18 and Circle No. 289

While work is still continuing on the section of the Palisades Interstate Parkway that lies in New York State, the link that runs from the New Jersey side of the George Washington Bridge to the New York State line has been finished, providing motorists with some idea of the kind of road that will ultimately connect with the New York Thruway.

The New York extension of the Palisades Interstate Parkway, which runs along the Hudson River shoreline, will not only tie into the Thruway, but will also continue on to the completed section of Parkway that runs from the Thruway interchange to Bear Mountain, N. Y.

Construction of the last 3-mile New Jersey section of the parkway, located just south of the New York State line, was done under a \$3,500,000 contract by Samuel Braen Construction Co., Wyckoff, N. J. This contract included handling 75,000 yards of rock and 75,000 yards of borrow, completing 30,000 yards of

roadway excavation, and putting down two 24-foot divided asphaltic-concrete roadways.

Drilled and blasted rock, loaded to a fleet of Euclid rear-dumps by a Lorain 2-yard shovel, was hauled to a waste area adjacent to the job. Borrow was handled by another 2½-yard shovel, which loaded a fleet of Autocar 12-yard dump trucks.

Base course and paving

An 8-inch-thick water-bound macadam base course, using 2½-inch minus stone, was put down on the grade and vibrated and tamped with a self-propelled, adjustable Road Packer. This unusual rig was equipped with tamping pads or shoes that were lowered to increase the effective tamping-vibrating width. All the shoes were raised whenever the rig moved from one location to another.

The 1½-inch-thick asphaltic-concrete binder course was put down in 12-foot widths by a Barber-Greene paver, compacted with a Galion

*Lightweight, portable air-cooled engine drive **AC Power—AC Welding anywhere!**

No contractor can afford to be without this valuable 2-in-1 unit that gives you welding current anywhere for maintenance, repair and construction—and with a flip of the switch gives you 110 volt AC power for tools, lights, motors. Your own men can use—you save hundreds of dollars by doing your own repair work—by having current available for welding or power when and where you need it. Coupon brings complete information—no obligation.



Cut costs—save hundreds with this lightweight portable welder. Save on replacement parts. Avoid costly delays and down time. You make repairs right on the job.



250 amp.
"Contractor's Special"
"Husky Boy"
Air-Cooled

HOBART "One of the world's largest builders of arc welding equipment!"

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 290
CONTRACTORS AND ENGINEERS

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On the Samuel Braen Construction Co. job, which carried the road to the New York State line, the asphaltic-concrete wearing surface is put down by a Barber-Greene finisher and rolled immediately by an Austin-Western 10-ton, 3-wheel roller.



Just a short distance from the Braen spread, George M. Brewster & Son uses a Lorain crane with Amsco 2½-yard bucket to load borrow material to a Euclid belly-dump. This equipment moved a total of 350,000 yards of material.

3-wheel, 10-ton roller, and finished with a Galion 10-ton tandem. Asphalt, delivered from a commercial asphalt plant owned and operated by Braen, was hauled to the paver in Mack dump trucks. The 1½-inch wearing surface, put down much the same as the binder course, was compacted by an Austin-Western 10-ton, 3-wheel roller and the Galion tandem. Cement-concrete reflectorized curbs were installed along each edge of the roadway to separate the pavement from the grassed shoulders.

After paving had been completed, a Gradall was used to cut side roadway ditches along sections where ground, left undisturbed to form the road divider, was higher than the roadway. John Escalano served as the superintendent for Braen.

Another section graded

While a short New York stretch at the end of Braen's contract was still being completed, work on the next project in line—a 2-mile grading job

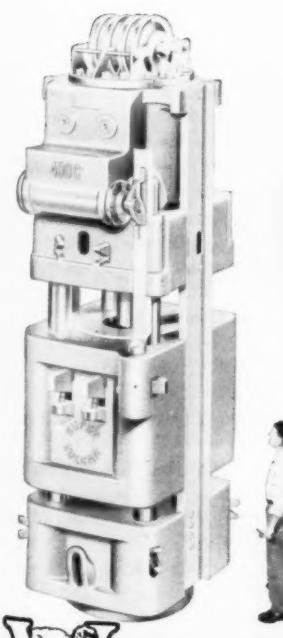
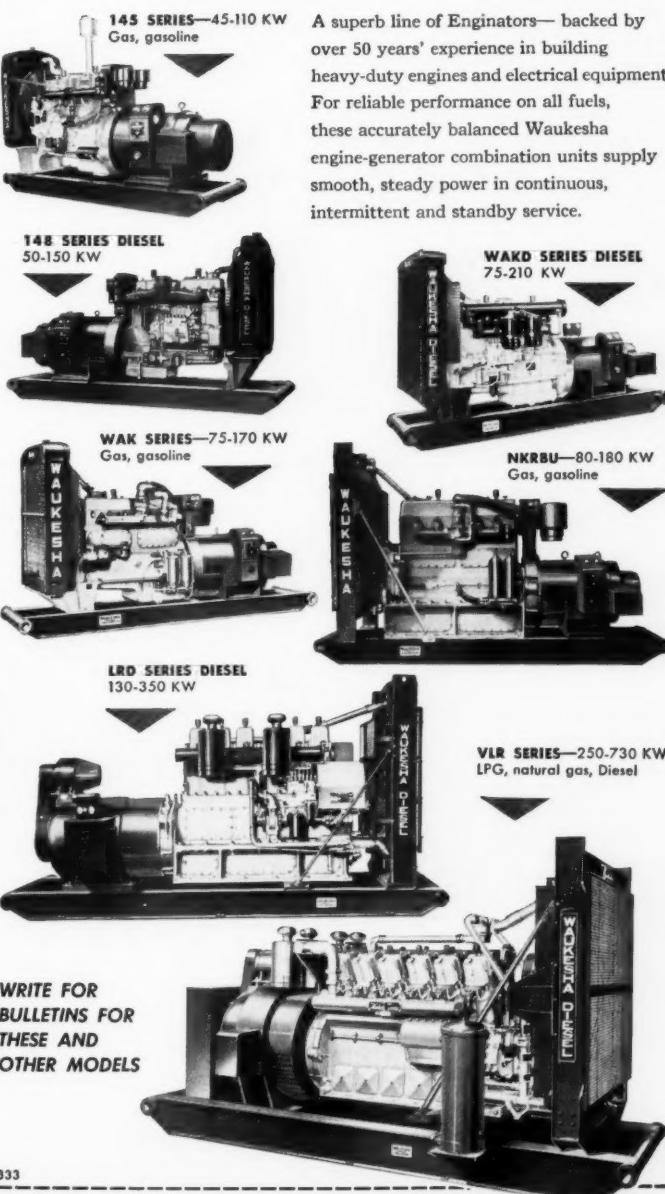
THE END

in Rockland County, N. Y.—was finished by George M. Brewster & Son, Inc., Bogota, N. J. Quantities on this job included more than 200,000 cubic yards of roadway excavation and 350,000 yards of borrow—both of them used for fills. No rock was encountered on this stretch, near Orangeburg, N. Y., which was supervised by Frank Itro.

Excavated material was handled by four Euclid 14-yard belly-dumps. At the borrow area, a Lorain shovel with an Amsco 2½-yard bucket excavated the material. Three Caterpillar DW21 scrapers, push-loaded by a Caterpillar D8 tractor, handled the roadway cuts, and another Caterpillar D8 spread the material. A Cat D6 tractor, pulling a LeTourneau sheepfoot roller, spread and compacted material for the lifts. Unlike the pavement on the New Jersey side of the line, both 24-foot roadways in this section of the parkway will consist of 9-inch reinforced-concrete slabs.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 291

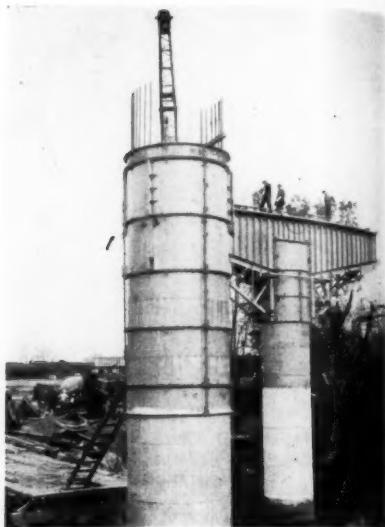
APRIL, 1957

WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN RAILWAY DIVISION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 292

Self-supporting steel forms telescope for varying pour heights on turnpike bridge

Steel forms, designed by the Blaw-Knox Co., are shown on the James River bridge project. They are self-supporting rather than guyed. A 2-foot lap ring is left in place after a pour to support 4-foot circular sections for the next pour.



When You Bid These Highway Jobs . . . BE READY WITH CEDARAPIDS

(above) In hard limestone with 16% silica, this 4350H Double Impeller Impact Breaker produced 2400 tons per day, of which 1900 tons are 1" material or larger.
 (right) Portable Double Impeller Impact Breaker eliminated dirt and soft stone to meet Kansas Turnpike specifications with 250 TPH production.

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CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKERS

With specifications getting tougher, and aggregate material often of questionable quality, more and more producers are turning to Cedarapids Double Impeller Impact Breakers. It's one of the most successful money-makers in difficult conditions for either portable or stationary applications. These efficient units are easily adjusted to produce a minimum of fines and crush, selectively, mixed hard and soft material to desired sizes. They work efficiently in wet and dirty material because it won't pack in the breaking chamber.

High ratio of reduction . . . up to 40 or 50 to 1 . . . produces big tonnages of specification aggregate in one pass. Maintenance is low since

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While many of these units are working in limestones, they are also successfully used for gravel, basalt, dolomite, sandstone, iron ore, lead ore, zinc ore and uranium ore. For the complete story, see your Cedarapids Dealer today.

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The complete line of Cedarapids crushing equipment will handle practically any aggregate production problem in portable or stationary plants. Ask about Single or Twin Jaw Crushers, Roll Crushers, and Hammermills, available in a wide range of sizes. Also Horizontal Vibrating Screens, Conveyors, Vibrating Grizzlies, etc.



IOWA MANUFACTURING COMPANY
 Cedar Rapids, Iowa, U. S. A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 293

A basically new idea in steel column forming and a new system for holding steel forms in place during a pour has been realized in the construction of the James River Bridge in Richmond, Va. The bridge, which is part of the Richmond-Petersburg Turnpike, was designed by Dr. E. B. Steinman of New York, N. Y., and is being constructed by the Richmond-Petersburg Turnpike authority. The general consultant is the firm of Parsons, Brinckerhoff, Hall & Macdonald of New York.

The bridge's substructure is made up of single columns, 7 feet 9 inches in diameter; these are topped by 44-foot-wide T-heads which support the roadway. Since the height of the columns vary, it was necessary to make an adjustable, circular, telescoping form for the initial pillar pour atop the foundation. Rustication grooves were placed at 8-foot intervals in the concrete. The circular forms, designed by the Blaw-Knox Co., Pittsburgh, Pa., can be adjusted to any height.

According to the contractor's requirements, the circular forms had to be constructed so that they did not have to be guyed. This was accomplished by the use of a 2-foot lap ring. Setting up for each pour, the contractor installed circular 4-foot sections and these were topped with a 2-foot ring. The pour, in 16-foot lifts, is to the top of the lap ring.

After the concrete had set, all rings below the lap ring were removed and reset on top of the pillar. The lap ring was left in place, securely held by the two feet of concrete inside it and supported by the vertical pressure added above.

Several sets of special pier rings, fitted with hangers to support the base and bulkheads of the "T", also eliminated guying of the hammerheads.

Each contractor had enough steel forms to pour six columns. Since side wall forms for the hammerheads had to remain in place longer than the base forms, contractors had approximately twice as many base forms.

When completed in 1958, the bridge's two 40-foot roadways will be supported by 100 columns. The overall width of the structure is 90 feet. The bridge will have a 4-foot median and 3-foot sidewalks.

THE END

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The LeTourneau Transporter is driven by electric motors located in the rims of each of its six wheels. It has a capacity of 35 tons and can travel over terrain inaccessible to other types of equipment.

Electric motors in wheels power huge 35-ton truck

A huge "roadless truck" which can haul 35-ton loads across rough terrain is available from R. G. LeTourneau, Inc. Each wheel of the Transporter is driven by a powerful electric motor inside its rim. The entire machine is operated by several switches inside the cab.

Power to operate the motors in each of the Transporter's six 73-inch-diameter wide-base tubeless-tire wheels is drawn from LeTourneau generators driven by a 335-hp diesel engine. Electric motors are also located at all other points of power application. One lever in the cab controls speed and the regenerative braking system, another controls the electrically powered steering of the front wheels.

The Transporter is nearly 40 feet long, 13½ feet high, and 12 feet wide. It has a 17-inch ground clearance and a turning radius of 36 feet. It has a top speed of 16 mph. According to the manufacturer, its most important use is to haul tractors and other heavy equipment into inaccessible areas. With the attachment of a giant land-clearing blade, it can be used for uprooting trees and clearing underbrush for right-of-ways, the manufacturer points out.

For further information write to R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Texas, or use the Request Card at page 18. Circle No. 53.

Sealing joints, cracks topic of HRB bulletin

Highway Research Board's Bulletin 138, "Joint and Crack Sealing", contains two papers, the first of which discusses the savings that resulted from cleaning and resealing concrete pavement joints by contract in Connecticut. Procedures and costs are given.

The other paper reports on the results of a current practice questionnaire on jointing, fillers, sealers, and equipment circulated in 1955 by the committee on joint materials in concrete pavement.

Bulletin 138, priced at 60 cents, may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

I-H offers training kit; new technician ratings

A training program for distributors and mechanics who work on International Harvester equipment has been set up at Melrose Park, home of I-H's Construction Equipment Division. The courses which are held at Melrose Technical Institute—International's factory school—are also available to distributors in 59 training kits which have been prepared by the staff of Melrose Tech.

The training kits, for a distributor's customers' service men and operators, deal with every phase of the Model 65 and 95 Payhauler, Model 12 Payloader, Payscraper, torque converter, crawler tractor and diesel engine, and miscellaneous parts. Each kit includes complete motion pictures

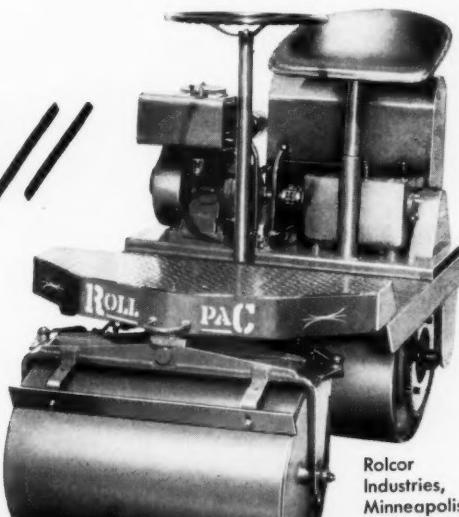
or slides to illustrate the service procedures.

Those who complete the courses may qualify for the I-H ratings for service technician No. 1 and/or 2, and finally master technician. The applicants must have either 2, 4, or 8 years experience working on I-H equipment; complete 15, 30, or 50 courses, some of which are required subjects; teach a certain number of courses; and satisfactorily complete the final examination.

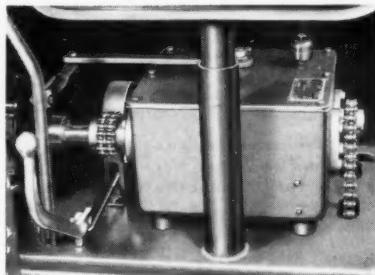
Information on training customers' operators and mechanics and on the technical ratings may be had by writing to the International Harvester Co., Service Development Section, P. O. Box 270, Melrose Park, Ill.

Ready to Roll

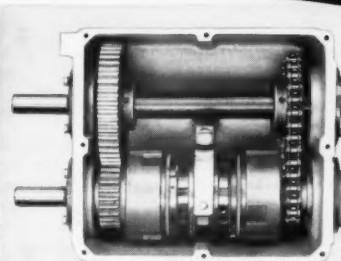
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DIAMOND
ROLLER CHAIN
DRIVES



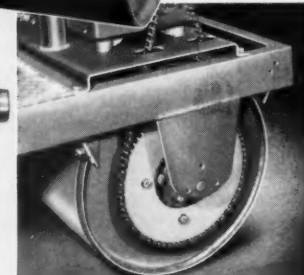
Rolcor Industries, Minneapolis, Minnesota.



Diamond Flexible Coupling, on the left, delivers full power from the Briggs & Stratton engine to the transmission. Final drive output shaft is on the right.



Interior of the transmission shows clutch mechanism for forward and reverse operation. Forward drive is through Diamond Roller Chain.



Final power drive is Diamond No. 449 Roller Chain. The use of Diamond Drives from motor through final drive delivers optimum engine power to the drive roller.

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Rollpac's many uses of Diamond Roller Chain illustrate the adaptability, economy and performance you can expect when using Diamond Roller Chains for machinery and equipment.

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distances and high or low speeds are easily accommodated.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 294

Electronic short cuts help engineers design more roads

The application of electronics to highway work is as realistic as the Federal-Aid Highway Act of 1956.

It became clear several years ago that engineering productivity had to be increased if an expanded highway program was to be undertaken. And forward-looking highway officials counted on electronic devices, photogrammetry, and other modern methods and equipment to save engineers' time by replacing many of the traditional hand methods of procuring, processing, analyzing, and presenting engineering data.

Although the trend toward the use of electronics is relatively new, much progress has been made. Some state highway departments are re-evaluating basic engineering data requirements and tolerable standards of accuracy that have been traditionally acceptable. In this work, the departments endeavor to answer three questions: Which of our traditional engineering operations are needed? How can those which are not essential be eliminated? How can we expedite those that must be continued?

Obtaining earthwork quantities

At the present time, high-speed electronic computers are being used to calculate earthwork quantities by the state highway departments in Arizona, California, Nebraska, Texas, and Washington, and by the U. S. Bureau of Public Roads. A number of other state highway departments, including Illinois, Louisiana, Massachusetts, Missouri, New Mexico, New York and Ohio are in the process of developing electronic computer programs for obtaining earthwork quantities.

These programs center on high-speed calculators that store a quantity of data for later use. The operation of these machines is controlled by a predetermined program of calculations that the machine is to make in arriving at the solution of a particular problem. When a program is placed into the machine and the computer is turned on, the machine will store data, add, subtract, multiply, divide, check, punch, and perform other operations in a proper sequence to give the solution of a particular problem.

Typical of a program for earthwork calculations is that developed for use in Illinois. Under this program the computer performs these twelve steps:

1. It reads and stores the general earthwork formula.
2. It reads and stores the cross-section templates.
3. The machine reads and stores the cross-section elevations and distances as determined by a field survey or by photogrammetry.
4. Gradient data—including tangent grades stations of P. I.'s and length of vertical curves—is read and stored by the calculator.
5. It calculates centerline elevation

of each cross-section, one at a time.

6. The applicable cross-section template is selected.
7. The machine prints out the location of slope stakes by distance and elevation.
8. It calculates end areas.
9. It applies shrinkage factor to fill end areas.
10. It picks up end area value for

previous cross-sections.

11. Volumes of cut and fill between successive cross-sections are computed by the machine.

12. It prints earthwork quantities.

Earthwork quantities can be obtained with the electronic computer much faster than with hand methods, but in addition to saving time on a problem, the machine saves the time

of engineers. This method has a great deal of flexibility. Alternate grade lines can be checked very quickly. Once the program has been developed, it can be used for any earthwork problem, regardless of the width of the right-of-way, the cross-section template, superelevation of curves, and other variables.

The time required for the calcula-



FIVE AXLES distribute the weight of this stripped-down American 300 Series Truck Crane owned by Moore Dry Dock Company. By carrying the counterweight and extra

boom sections on a trailer, the Oakland, California firm can move without permits over any highway because the machine meets legal axle load limits.

American 300 Series' "Strip-Ease" SOLVES HIGHWAY WEIGHT PROBLEM

How much work or red tape is involved in moving your crane from one job to another? Unless you can move your equipment speedily from place to place, it's cutting into your profits and can be slowing down your whole operation. American engineers knew how weight restrictions could affect crane mobility when they designed the 300 Series machine. As a result, they designed this machine to "strip" quickly, using engine power to do the work—even spot the counterweight on truck or trailer. Americans, ready to move faster and

ready to work sooner, earn bigger profits!

Why do American cranes spend less time between jobs? They do much of their own set up and disassembly work—use engine power to erect the gantry—handle the counterweight and lift as much as 100 feet of boom and 30 feet of jib right from the ground! There are many reasons why American Cranes spend less time between jobs—do more work on the job. Your Distributor will tell you all about the American line that starts with a $\frac{1}{2}$ -yard, 12½-ton machine!

THREE STEPS, using the crane's power, strips the 300 Series. (1) lowers the counterweight; (2) picks up counterweight and swings it over trailer; (3) lowers it into place on specially built trailer. Final operation is to lower the boom onto trailer, then drive off.



States experimenting with computer programs pool information; progress being made on integrating system with photogrammetry

by H. A. RADZIKOWSKI
Chief, Division of Maintenance
U. S. Bureau of Public Roads

tion of earthwork quantities with the electronic computer—including the preparation of input data—ranges from 5 to 10 per cent of that required by manual methods. Data on relative costs are being developed, and rough estimates indicate that earthwork quantity calculations with the electronic computer cost from 20 to 25 per cent of those obtained by hand

methods. In California, the average cost for earthwork computations by electronic methods has been approximately \$50 per mile.

Note that the use of the electronic computer may make it possible to do away wholly or partially with cross-section sheets. The degree to which this traditional but time-consuming operation can be eliminated is cur-

rently under study.

Works with photogrammetry

Note also that some of the data fed to the electronic computer may be obtained either from field surveys or by the photogrammetric methods that are coming into wider use.

There is an increasing need for close partnership between the high-

way engineer, the photogrammetric engineer and the electronics engineer. Photogrammetry may be considered a data-procuring system. The electronic computer is a data processing system. These two must be integrated for maximum efficiency by the development of a thoroughly co-ordinated data-handling system.

Each step and phase in this production line should be geared to the next to assure the continuous rapid flow of raw material into the system and the final answers from the output end of the line. Such a system will require the elimination or reduction of some of the conventional data-procurement and data-processing methods that are now performed manually.

New developments show progress toward this objective. The Ohio Highway Department, for example, has an attachment that permits cross-section data obtained from aerial photographs with a Kelsh plotter to be punched directly into cards. Development work such as this has been under way for some time, and it indicates the possibility of a fully-automatic stereoplottting system in which the human element is replaced by electronic devices. The number of man-hours now required to put in ground control for aerial surveys may also be reduced by another new application of electronics. This consists in the calculation of distances up to this point.

The development of electronic computer programs is by no means confined to this one problem alone. The computer center in Sacramento, Calif., not only calculates earthwork quantities for from 80 to 500 miles of highway per month, but also provides a traverse computation service for all of its district offices. Each district office tabulates its survey notes on traverse computation sheets, which are forwarded to the computer center. The tabulations are processed and the results are mailed back on the day received. The average output from the computer center has been 2,000 courses per day. The cost per course has been reduced from 13 cents when calculated manually to five cents when performed by the electronic computer. This service has expedited highway design, bridge design, and right-of-way calculations. One California engineer claims that the computer service cut to half the time required to design an interchange. Another design engineer reports that he now uses one to two men for calculations in the design process, where he formerly used three to four men.

Use for structures

The American Bridge Co. reports the use of an electronic computer program several thousand times in calculating the stress values for truss members during several stages in the

←For more facts, circle No. 295

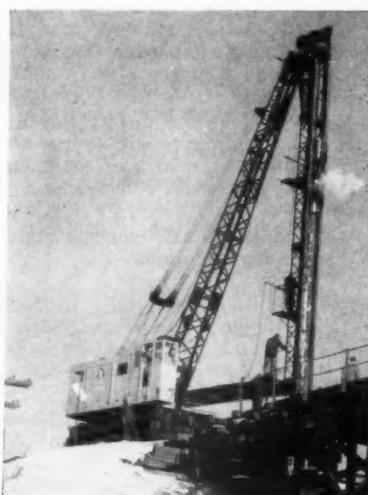


CAPACITY PRODUCTION job after job", sums up owner reports on the big American 700 Series Crane. Precise design eliminates unnecessary, power robbing weight without sacrificing strength. As a result, you get higher work capacity in relation to weight. The 700 Series Dragline shown above is handling a 2½-yd. bucket. It gives its owner high production, economy and limited downtime—gives its operator air controls and fast, simple preventive maintenance! This American is available on a crawler or truck mount with a variety of fronts.



NEW ADDITION to the American Line is the highly maneuverable, extremely versatile 200 Series Truck Crane. Many big crane features—proven on the 300 and 700 Series—have been built into this ¾-yard, 22½-ton machine. As a result, production ability goes up while operating and maintenance costs drop to an amazingly low figure. You'll see why you get big crane performance at smaller crane cost when you examine the new 200 Series with any front end attachment on crawler or rubber mount.

PILE DRIVING is just one construction and maintenance of way job performed by American Locomotive Cranes for the nation's railways. Volume materials handling jobs around the plants and yards of the world's big industries—automotive, metal production and fabrication, paper and forest products, public utilities, petroleum and many others—are everyday assignments for big American Locomotive Cranes! American designs and manufactures cranes, hoists and derricks to do the world's work faster, better and at lower cost!



AMERICAN HOIST and Derrick Company

Saint Paul 1, Minnesota

erection of various structures. The types of structures involved have included bridges with up to five continuous spans, cantilevers, arches, trusses with K-web systems and others with double subdivided panels, spans eight panels long, and bridges eighty panels long.

Some of these calculations involved the solution of as many as twenty simultaneous equations. On the computer, that operation takes ten minutes. The American Bridge Co. reports that suspension bridge calculations alone have resulted in savings great enough to pay the rent of the electronic computer. The company also estimates an average saving in calculation cost by the use of electronics as 75 per cent of the cost of the equivalent calculation performed manually.

A U. S. Bureau of Public Roads engineer on the Washington staff has prepared a program that covers the computation involved in the structural design of a continuous steel beam highway bridge of 3, 4, or 5 spans. The computer is given the number of spans, the span lengths, the allowable stresses, and the loads. The machine points out the maximum moments and shears produced by the given loads as well as the sizes of the beams and the flange plates required for these moments and shears. AASHO bridge design specifications were used.

The state of California is completing electronic computer programs for the design of composite beams, the design of columns, assignment of traffic to a freeway, desire line control chart for metropolitan traffic, origin and destination data, processing of loadometer data, and for short-radius turn data for three center curves with tangent approaches.

Nebraska has completed programs for earth computation, and for dead-load deflection calculations for any girder or slab structure in steel or concrete, either simple, continuous, or cantilever, with members of variable moments of inertia. Oregon has developed computer programs for origin and destination surveys, delay time studies, traffic placement studies and traffic accident analyses. Texas and Washington have made considerable progress in developing computer programs. Massachusetts is doing promising work with the Massachusetts Institute of Technology in combining the use of electronic computers and photogrammetry.

Program development

Some engineering consulting firms are also doing a lot of work in developing electronic computer programs. One consultant recently reported the completion of a program for horizontal curves and horizontal alignment computation in respect to very involved geometrics of a major interchange. The firm is also approaching completion of a program for the computation of combined horizontal and vertical curvature involved in complicated steel frame plans for bridge, and in determining pad elevations for steel superstructure supports and similar complex problems. They plan

to develop other material for use in repetitive stress calculations required for viaduct bents or framed bridge piers, for the design of sheet piling, retaining walls, and all types of beam spans, together with the computation of influence lines, the evaluation of stiffness factors, and the deflection of beams and trusses.

This same consulting engineering firm has pointed out that the work preliminary to the writing up of a program for the solution of a specific problem by electronic computations is extensive. Many highway depart-

ments and consulting engineering firms are working on similar problems. This consultant recommended the pooling of electronic computer programs for the benefit of the entire highway engineering profession through a board or council representative of various highway organizations. This unit would act as a clearing house to avoid duplication of effort, for the receipt of completed programs for electronic computers, and for the issuance of such programmed material to all of the membership of the highway profession.

Pooling information

The Bureau of Public Roads is in the process of establishing an electronic computer program library that will maintain, in current status, the electronic computer programs developed in the state highway departments, the bureau, and other highway engineering organizations. Incoming material will be subject to engineering analysis and correlation and then made available to any state highway department on request.

The most recent instance of the pooling of the latest developments in



How to get your scrapers ready for heavy schedule of work

44-point check-list for Spring maintenance and "de-mothballing"

You'll eliminate a lot of maintenance headaches, and get steadier dirtmoving output during the busy season ahead, by carefully preparing your equipment. Remember, a \$5 repair put-off today, may cost you \$500 in lost dirtmoving time later! This check-list will help your crew head-off most equipment-failure troubles before they start.

General

- 1. Before moving machine, check: closure of all drain-cocks; adequate level of coolant, lube oil, hydraulic fluid; tire pressure.
- 2. Adjust parking brake for positive holding.
- 3. Clean and inspect structure and frame-members of scraper and prime-mover; weld or replace broken parts; paint exposed metal.
- 4. Check axle bearings; adjust or replace; lubricate.
- 5. Clean and check ball-and-socket joints, hinge pins, tailgate rollers and bearings; adjust or replace as required.
- 6. Inspect cable sheave wheels and rollers; replace if worn or if not functioning 100% smooth.
- 7. Replace weak or frayed control cables; lubricate (except for heavy-dust operations).
- 8. Replace, reverse, or surface-weld worn cutting blades; replace worn ground plates.

Tires and Rims

- 9. Check rims for bent or damaged flanges; repair or replace, as needed. Tighten wheel bolts.
- 10. Check tires for cuts and breaks; remove stones or metal fragments; recap or switch worn tires to trailing wheels; repair or replace damaged tires and tubes.
- 11. Inflate tires in accordance with your operating manual. Post correct tire-pressure schedule in cab.

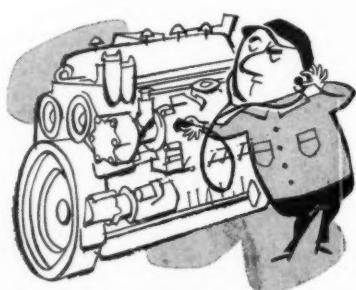


Cooling System

- 13. Drain and back-flush radiator, engine block, oil cooler and compressor jackets. Remove scale with sal soda or good radiator cleaner; flush thoroughly. Repair leaks in radiator, water pump, hoses and connections. Repair radiator as follows:

Freeze-up zone — use permanent anti-freeze (ethylene glycol) to give year-round protection, adding clean, clear water to fill system.

Warm zone — use clean water free from lime or alkali; add inhibitor or 4% soluble oil.



Engine

- 12. Perform all periodic maintenance procedures (incl. 1000-hr check), as shown in engine manual.

- 14. Check thermostats for operating temp., and full closure; disassemble not operating as stamped.

- 15. Clean dirt and bugs from radiator core and fins.

electronic computers, photogrammetry, and other modern devices took place last month when a three-day meeting, March 5 through 7, was held in the Biltmore Hotel, Los Angeles, by more than 300 representatives of state highway departments, cities, Bureau of Public Roads, consulting engineering firms, universities, associations, and electronic computer manufacturers. Seven electronic computer makers demonstrated the use of their machines at this conference, which was under the joint sponsorship of BPR, AASHO, WASHO, the

California Department of Highways, and the University of California. This is the third of a series of such conferences; the previous one, in July, was held under the sponsorship of the Southeastern Association of State Highway Officials at Atlanta, Ga.

Other electronic devices

The electronic computer is only the newest member of the electronic family to find use in the highway field. Radio, as a means of communication, has developed into a valuable tool to

expedite and coordinate highway department operations. Lately, it has been used to control and synchronize the operation of traffic signals, and the result has been a decided improvement in the flow of traffic.

Television equipment, installed on bridges and other critical highway sections, has demonstrated its usefulness in facilitating the handling of emergencies and in reducing traffic tie-ups.

Electronic weighing devices are in operation on some of our highways now to weed out probable violators of

vehicle load limitations. Radar speedometers are producing data on speed characteristics of traffic. Electronic controls have been installed on batching plants so that mix proportions can be changed with speed and accuracy.

These devices are now beginning to be integrated into the highway engineering field, and they promise substantially increased productivity of present highway engineering organizations.

Electronic computers, photogrammetry, and other modern techniques will not reduce the need for the knowledge and experience of the professional highway engineer. His contributions to highway engineering in the future will be of a higher order than was possible when a huge volume of detailed work had to be done. Relieved of these routine, time-consuming tasks by the new procedures, he will be able to devote his time and energy to more important problems. The modern devices, wonderful though they are, do not have the brains to assimilate engineering knowledge and experience. To a greater degree than ever before, this must come from professional highway engineers.

THE END

Cooling System (continued)

- 16. Check water-pump pulleys for slippage or excessive "play"; repair or replace as required.
- 17. Replace frayed or stretched fan and water pump belts; set tension to $\frac{1}{4}$ " deflection under thumb pressure.
- 18. Check accuracy of dashboard temperature gauge.



Fuel System

- 19. Drain water and dirt from fuel tank and filters.
- 20. Change filter cartridges; clean strainer.
- 21. Adjust fuel pump to supply recommended pressure.



Electrical System

- 22. Clean and inspect for loose or broken wires and cables; check solenoid and contactor action; dress or replace burned contactor points; tighten leads.
- 23. Clean and inspect starting motor and Bendix drive; replace brushes if worn; tighten leads.



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
Where Quality is a Habit

For more facts, use Reader-Reply Card opposite page 18 and circle No. 296

APRIL, 1957

- 24. Clean and inspect generator; replace brushes if worn, tighten leads. Check ammeter; adjust generator to recommended charge rate.

- 25. Scrape corrosion off battery, box, and cables; wash with bicarbonate of soda solution (1 lb. per gal.); rinse with water. Apply thin coat vaseline to terminals. Check plug vent holes.

- 26. Check battery for dead cells; add distilled water if plates are exposed; recharge.

- 27. Check lights and illuminated warning signals; replace burned-out lamps.

- 28. Clean and inspect electric motor windings, rotor and brake, adjust brake clearance; tighten leads.

- 29. Check all electric switches for positive, instant action; clean, repair, or replace as required.

- 30. Clean transformer; check and tighten leads.

- 31. Blow dust from rectifier; clean pre-cleaner cap.



- 32. Inspect for damaged air lines and fittings; repair leaks; replace bent or dented tubing.

- 33. Check diaphragm of multiple-disc brakes. Clean hub splines.

- 34. Bleed water condensate from air supply tank (add alcohol in freezing weather).

- 35. Clean compressor air cleaner; refill with oil. Replace frayed or stretched compressor belts; set tension to $\frac{1}{2}$ " deflection under thumb pressure.

Hydraulic System

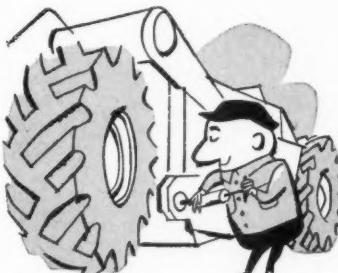
- 36. Inspect for damaged hydraulic lines and fittings; repair leaks; replace bent or dented tubing.

- 37. Check for cylinder leakage, bent rods, seals; repair.

- 38. Check pumps for leakage; adjust belt tension. Set pressure per manufacturer's recommendation.

- 39. Check operation of all relief valves.

- 40. Bleed air from lines; check fluid level.



Lubrication

- 41. Clean and inspect all lubrication points, replace broken lube fittings; clean screens and strainers; install new filter cartridges.

- 42. Thoroughly lubricate engine, transmission, prime-mover, and scraper according to all periodic lubrication schedules suggested by manufacturer (including 1000-hr. or 100-shift check). Use lubricants specified by manufacturer.

Finally, before operating

- 43. Be sure all drain-cocks are closed; check for full level of coolant, lube oil, and hydraulic fluid.

- 44. Check parts stock and build up inventory for quick repair and less down-time.

Write or phone for as many copies of this LeTourneau-Westinghouse check-list as you need.
G-1401-G

From a paper presented by H. A. Radzinski at the annual meeting of the Association of Highway Officials of the North Atlantic States at Atlantic City, N. J.

Tractors, attachments

Industrial tractors and equipment manufactured by the John Deere Industrial Division are described in a catalog from the company. Models detailed include the 420 crawler and the 420 and 320 utility wheel tractors. Also shown are the front-end and the No. 61 angling dozer for the 420 crawler, and the Model 47 mower for the 420 wheel tractor. The 420 and 320 engines are pictured and described, along with the John Deere forced-feed lubricating system. Many other attachments are included.

To obtain this catalog write to the John Deere Industrial Division, 3300 River Drive, Moline, Ill., or use the Request Card at page 18. Circle No. 24.

Corps of Engineers names Johnson district engineer

Col. Stanley T. B. Johnson has been appointed district engineer of the U. S. Army Corps of Engineers Baltimore, Md., district, succeeding Col. Stephen E. Smith. Col. Smith has been assigned to Korea.

As the Baltimore district engineer, Col. Johnson will direct military construction programs in Maryland and parts of Pennsylvania, including all construction projects at the Aberdeen Proving Ground, Fort George G. Meade, Army Chemical Center, and Fort Holabird. His responsibilities will extend to various river and harbor activities, and to the maintenance of the Baltimore Harbor and channels of the Chesapeake Bay, as well as flood control work in the Susquehanna Watershed in the states of Pennsylvania and Maryland.



Difficult cofferdam driving job completes initial work at dam

Alluvial gravelly material, which forms the bulk of the ballast in the cofferdam cells, is loaded from the river to a White dump truck by a Bucyrus-Erie 54-B dragline with Hendrix 2½-yard bucket.

Despite some rugged work in driving a large amount of used steel sheeting, Guy F. Atkinson Co., South San Francisco, Calif., has finished first-stage cofferdam work for the Snake River's Ice Harbor Dam near Pasco, Wash.

Completion of this \$1,360,000 major contract—the first for the hydroelectric and flood-control facility—plus unwatering of the first work area have now set the stage for the construction of the dam proper.

Located at the head of the McNary Dam pool on the main stem of the Columbia, just a few miles above the mouth of the Snake River, the facility will consist of a concrete gravity-type dam with a wide spillway section, a hydroelectric powerhouse, and navigation locks for barge traffic. Work on this U. S. Army Corps of Engineers' dam has been deferred for many years because of higher priority construction on the Lower Columbia. But the completion of Atkinson's contract has put construction well on its way at the Ice Harbor location.

Designed to be overtapped

Atkinson's initial contract called for first-stage cofferdam construction, miscellaneous excavation, and the placing of riprap to protect the right bank of the Snake from erosion. Though the contract called for the cofferdam to be unwatered, it did not provide for foundation or abutment stripping.

The cellular steel sheet-pile cofferdam was designed by the Corps to protect the work area, even if the river rises 33 feet above mean low water. Should flood stages get higher, the cofferdam can be overtapped without being damaged excessively.

The cofferdam is made up of 52 and 62-foot-diameter cells, plus cloverleaf-type quadrupole steel cells measuring about 75 feet across. It is linked to the left bank at both ends by an earthfill-type dike.

It was expected that some of the steel sheet piling previously used at The Dalles and McNary dams would have to be re-used at Ice Harbor, but since the steel strike placed sheeting in short supply for months, an unusually high percentage of used steel sheeting had to be driven for the cofferdam.

Before actual driving operations began, all but 3 feet of overburden above the basalt foundation rock had to be removed. In some places, the overburden went as much as 26 feet deep, and this meant extensive work by Atkinson's floating derricks, which were equipped with 3½-yard clam-



buy from the line of strongest design... Hercules!



Hercules Model 1215 high-speed telescopic hoist and CD-20 batching body handles four 5,150 lb. batches for J. A. Jones Construction Co.

for high-speed, cost-cutting batching work...

New Hercules hoist raises and dumps
in less than 6 seconds!

2,500 ft. of 24 ft. x 9 in. slab per 9 hour shift! That's the amazing production pace maintained by J. A. Jones Construction Co., Charlotte, N. C. on a recent by-pass job near Mansfield, Ohio—thanks to Hercules' new high-speed telescopic hoists.

Because the batch trucks could back into the skip, dump, and pull clear in 11 seconds, the dual-drum pavers were able to deliver a 37.4 cu. ft. mixed batch at 51 second intervals!

Especially designed for Jones' use on this job, the new Hercules high-speed hoist raises to full dump position in 4 to 6 seconds. A special new bleeder valve

provides hydraulic cushioning at the end of the lifting stroke. And, accelerating the truck engine at the top of the stroke provides a rapid 4 to 10 in. rising and falling motion of the truck body. Complete, clean dumping of each batch is assured, without "frogging" the truck. According to the contractor, Hercules 6 second, 4 batch equipment has reduced his investment in batching trucks 20%.

See your Hercules distributor . . . he'll show you how this new hoist and batching body can boost production and cut costs on your paving jobs, too. Call him now!

AA-4612

HERCULES STEEL PRODUCTS COMPANY, GALION, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 298

The Clyde derrick barge Santiam drives steel sheet piles for one of the cofferdam cells far out in the river. It is equipped with a 100-foot boom and 20-foot jib to handle piling up to 60 feet long.

Steel strike forces contractor to re-use steel sheet piling in constructing 52 and 62-foot-diameter cells for Ice Harbor Dam

shell buckets for this operation. During this phase of the work, some minor trouble was caused by river currents washing material back through the toe of the work area to one of the outboard cells.

Pile driving

Though Atkinson ran into difficulties in threading and driving the used steel sheet piling in lengths up to 60 feet, the job moved rapidly. Actual driving was handled by a land-based Lima 1201 crawler crane and two floating machines—the Clyde derrick boat Santiam and the steam-powered American derrick barge Columbia. These last two rigs had also handled the job of removing overburden from the area.

The derrick on the Columbia, equipped with a 100-foot boom, plus a 20-foot jib from a Bucyrus-Erie 54-B crane, threaded the 60-foot piles across one of the 62-foot cells. Although mainly designed for clamshell dredging, the Santiam proved efficient for driving the shorter lengths of steel close to shore.

The pile sections were threaded around templates that had been made to fit the diameter of each size of cell. Some of the templates, used at McNary and The Dalles dams, were simply cut down and reassembled for the work at Ice Harbor. One 52-foot-diameter template, made of angle iron and portions of an old buckled crane boom, was used repeatedly during the construction of the 52-foot-diameter cells.

The templates were anchored in position by steel H-pile spuds driven through the anchor wells. As each template was positioned and anchored, the floating and land-based cranes set the steel sheeting.

Two methods of pile-hammer operation were used by Atkinson. A McKiernan-Terry 9-B-3 was operated by steam from the boiler of the steam-powered derrick barge, Columbia. Ordinary steam cylinder oil was used to lubricate the hammer. The McKiernan-Terry 9-B-3 handled by the Santiam and the Lima 1201 was operated by compressed air from a Gardner-Denver 600-cfm rotary compressor. Lubrication was supplied by air tools.

The McKiernan-Terry pile hammers were operated without leads by means of special driving anvils of the duckbill type. These, manufactured in the shops of Monarch Forge Co., Portland, Oreg., consisted of round steel members that fitted into the pile

(Continued on next page)



Big trucks pay off on the big jobs!

Competitive operation on today's big yardage jobs calls for big dumpers that can keep tight schedules—especially when you're running a shovel that makes a 30-ton load in three or four passes. That's why so many operators are turning to Mack. For Mack gives them the toughest and most economical off-highway dumpers, as well as a large selection of competitively priced units to choose from—four basic units with a wide selection of engines, transmissions and converters...from four-wheelers with a 15-ton rated capacity to six-wheelers with a 34-ton rated capacity.

Here are some of the exclusive Mack features—wide selection of Mack or stock diesels ranging from 170 to 400 hp, each delivering maximum torque at low r.p.m. . . . superior Mack transmissions with two-speed compound or torque converter . . . planetary gear reduction in rear-axle wheel hubs for smooth power transfer without excessively large gears in the carriers . . . the exclusive Mack Balanced Bogie with Power Divider, the four-wheel, rear-axle drive that delivers maximum power to the wheels with traction . . . many models available from stock, the units you want with the engines

and transmissions or converters you need supplied upon gratifyingly short notice.

Why not investigate the large-capacity economy afforded by the complete line of Mack off-highway dumpers? Invite your Mack representative to give you full details and specifications. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 299

(Continued from preceding page)



This Mack truck dumps fill material directly into one of the cofferdam cells.

hammer at the driving end, passed through tight guides, and terminated in the special duckbill tool. This tool fitted the inside of the web of a piece of AP3-type steel sheeting. The duckbill head was simply a sloping guide that made it easy for an operator to set the hammer down on a pile section.

As piling was driven, small centrifugal pumps and water jets on the supply barges next to the derrick boats cleaned sand, rust, and any foreign material from between the interlocking areas of the steel sheeting. The used piling, particularly, tended to stick, disturbing the general alignment of several piles around the template. Whenever this happened,

the pile-driver crews got the disturbed sections into proper position so that the sheet piling could be driven easily. In a few areas, where the basalt foundation rock sloped downward, short pieces of piling, up to 10 feet long, were welded to the 60-foot sections.

Filling the cells

Two types of filler material were used to ballast each cell. Special previous material was hauled in by truck and dumped through chutes and spouts until a 6-foot-deep zone had been formed directly inside the steel sheeting. The inner section of ballast consists of alluvial gravelly overburden dredged from the river by a Bucyrus-Erie 54-B dragline with a Hendrix 2½-yard bucket. This material was loaded to three White dump trucks rented from D. A. Whitley Co., Spokane. Four feet of cover rock at the top of the cells completed the cofferdam.

Personnel

Project operations for Guy F. Atkinson Co. were under the general supervision of Ralph L. Hawkins, project manager. He was assisted by George Miller, pile-driving superintendent; V. A. Chapman, excavation superintendent, and W. J. Hill, master mechanic.

THE END

Clark Equipment appoints service representatives

Seven dealer service representatives to cover 40 states, Hawaii and parts of Canada have been appointed by the Construction Machinery Division of the Clark Equipment Co., Benton Harbor, Mich. Joe Harrison of Arlington, Texas, will cover Texas, Oklahoma, Louisiana, Arkansas, and New Mexico; Cecil L. Starner of San Mateo, Calif., will handle California, Arizona, Nevada, Utah, and Hawaii.

Servicing Kansas, Missouri, Nebraska, Colorado and Wyoming will be Richard G. Fuller, Overland Park, Kans. Harold H. Cadell, Beaverton, Oreg., will cover Oregon, Washington, Idaho, Montana, British Columbia, and Calgary. Charles R. Lewis of Birmingham, Ala., will handle Alabama, North and South Carolina, Tennessee, Georgia, Florida, and Mississippi.

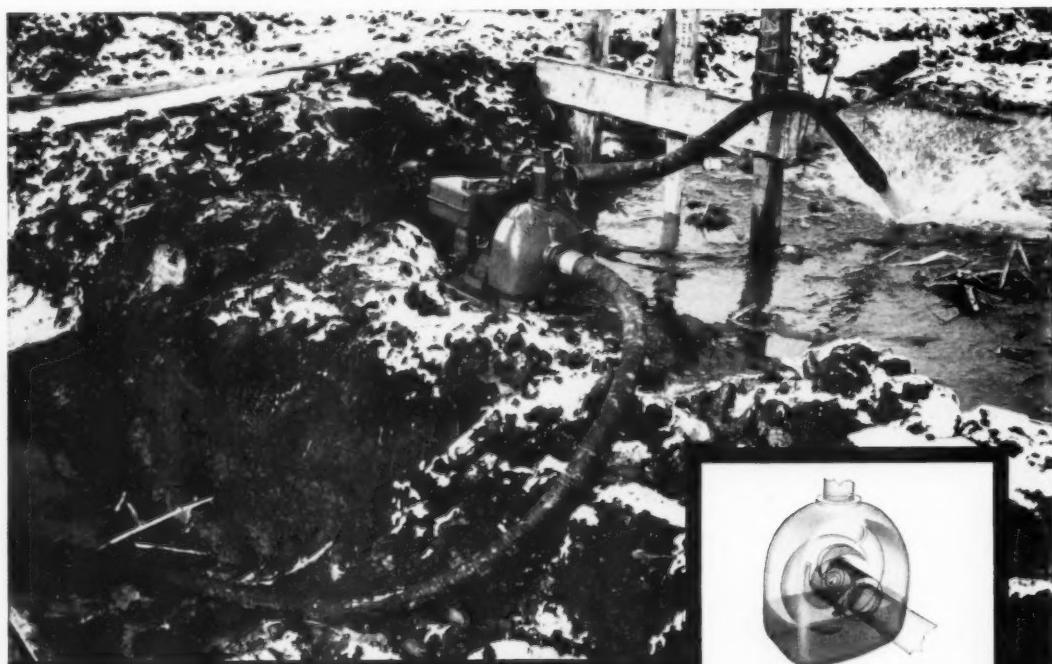
Other representatives are Carl W. Osborne, Muncie, Ind., for Indiana, Ohio, Pennsylvania, West Virginia, Virginia, and Kentucky; and Henry L. Spaulding of Southampton, Pa., for Pennsylvania, Massachusetts, Connecticut, Rhode Island, New York City and Long Island, New Jersey, Maryland, Delaware, and the District of Columbia.

Edouard G. Petit has been named district representative of eastern Canada for the firm's Construction Machinery Division. He will cover the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island.

The division has appointed Wendell V. Richards product specialist.

CONTRACTORS AND ENGINEERS

See the New Gorman-Rupp "80 Series" Pumps at Your Nearest Distributor!



SHOW STEALER!

At A. R. B. A. and on the job, too!

Here's an exciting new line of Gorman-Rupp centrifugal pumps that prime...with important features never before offered to pump users. Straight-in suction! No check valve! These pumps never fail, never quit. Nor will solids foul them*.

The new Gorman-Rupp design delivers pumped liquid direct to the eye of the impeller, increasing capacity, efficiency and lift. Simpler. Lighter in weight. Fewer parts. Now available in sizes 1½", 2" and 3".

You saw them at the Road Show!

THE GORMAN-RUPP COMPANY

305 Bowman Street • Mansfield, Ohio

*Provided standard equipment supplied with pump is used.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 300



PUMP AT REST—Captured liquid retained for priming. Note absence of the usual check valve.



PRIMING ACTION—Entrained air (B) escapes at (A) to be discharged. Priming liquid returns (C) to entrain more air.



PUMPING ACTION—Straight-in suction voids entrance restrictions. Water enters direct to the eye of the impeller.

The Econ
E-60 Clip
60-inch-w
swath.

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APR

The Economy Model E-60 Clipper has a 60-inch-wide cutting swath.



Grass cutting attachment clips 60-inch-wide swath

A grass-cutting attachment with a 60-inch-wide cutting swath is announced by the Servis Equipment Co. It is recommended for use in maintaining highway right-of-ways, median strips, and landing fields, as well as for cutting light brush up to 1½ inches in diameter.

The Economy Model E-60 Clipper is equipped with two free-swinging fan-type blades, steel-cut gears with Timken bearings, and an offset blade carrier. By using an adapter kit, the clipper can be converted into either a pull-type or lift-type unit.

For further information write to the Servis Equipment Co., 1000 Singleton Blvd., Dallas 21, Texas, or use the Request Card at page 18. Circle No. 28.

Converter unit provides in-the-drive-line brakes

Allison Torqmatic torque converters are now available with an in-the-drive-line braking setup which gives off-the-highway vehicles continuous braking power on downhill hauls under load. The Torqmatic brake uses the same oil that turns the converter wheel.

The Torqmatic brake is designed primarily for use in vehicles equipped with Torqmatic transmissions. With the retarder in action, the operator of the vehicle is said to have positive control at all times and can select any one of three speed ranges of the Torqmatic transmission with the retarder continuously applied.

Capable of absorbing approximately 400 brake horsepower, the Torqmatic brake has only one moving part—a rotor, or "paddle" wheel. The unit saves the friction brakes for complete stops or snubbing on curves.

For further information write to the Allison Division, General Motors Corp., P. O. Box 895, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 68.

Whiteman builds plant

A new \$500,000 plant, located in Pacoima, Calif., has been completed by the Whiteman Mfg. Co., Los Angeles, Calif., producers of concrete truck mixers, tower buggies, finishing machines, vibrators, and screeding machines.

The first unit of the new plant covers five acres and has a floor area of 52,000 square feet. It includes direct-line assembly lines, machine shops, storage facilities, an engineering department, and offices.

The Graco Hydra-Spray will empty a standard 55-gallon drum faster than it can be filled through the bung.

Rig dispenses liquids from 55-gallon drums

A high-volume spray rig that pumps such liquids as water repellent and farm oil directly from the original 55-gallon drums is announced by Gray Co., Inc. The Graco Hydra-Spray is said to be able to empty a drum faster than the fluid can be poured through the bung.

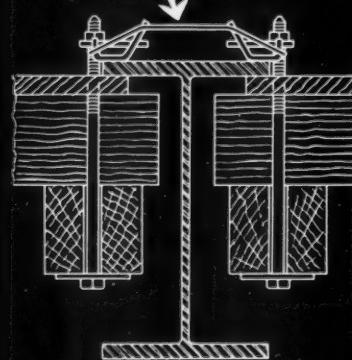
A fingertip trigger on the pole-type spray gun starts and stops the 13½-pound pneumatic pump. An adjustable nozzle on the gun can be quickly varied for heavy or fine spray. The pump operates either in an open head



or in the 2-inch bung opening of the drum.

For further information write to Gray Co., Inc., 1059A Sibley St. N. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 52.

Faster Adjustment from TOP of Deck



TOTAL SAFE LOAD ON BOTH COIL BOLTS IS 10,000 LBS. OR 5,000 LBS. PER BOLT

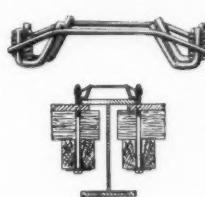
.. WHEN HANGING FORMS WITH SUPERIOR PLATE HANGER FRAMES



With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from above the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only 1/2" above the flange.

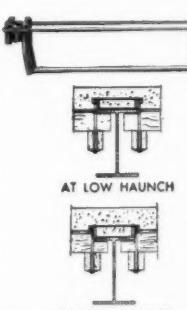
FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

STANDARD COIL HANGER FRAME



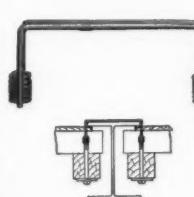
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior Standard Hanger Frames. Detail at left shows their use with double ledgers, 1/2" coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

SPECIAL HANGER FRAME



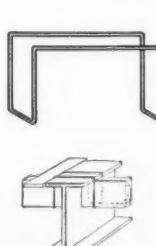
The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior Special Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the 1/2" coil bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per 1/2" bolt.

COIL BEAM SADDLE



On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each 1/2" Coil Bolt. Coil Beam Saddles are also furnished for 3/4" and 1" bolts.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 301



Two Reo dump trucks unload caliche base material at the job site. The truck in the foreground has a Cable dump trailer, and the one in the background is equipped with a Clement dump trailer.



Starting a section on a strip of paper to prevent overlap, an Etnyre distributor applies asphalt for surface treatment.



The compacted base on a section of the Valley Freeway, given a prime MC-1 cutback asphalt, is carefully broomed by a Grace broom pulled by a Clark airplane tow-tractor.

Using local caliche for base and shipping in natural rock asphalt, contractors are building a high-type economical pavement for the Valley Freeway in Lower Rio Grande Valley, Texas. When complete, it will link many of the cities and villages of the Valley, and provide better access to the area from the north and east. The shortage of suitable paving aggregates in the area forced contractors to ship the rock asphalt by rail from Uvalde County, 300 miles away—a move, in

spite of the long distance, that has proved very economical.

The Valley Freeway, like many other Texas expressways, is being built in stages—as traffic warrants and funds permit. On a given section, the initial construction may be just one of the frontage roads, the entire freeway, or any stage between. As a result, projects on the expressway will continue for several years.

In the completed sections, a median separates the two main roadways, and

these are separated from frontage roads by islands. All railroads and important crossroads are carried over or under the main freeway, and structures at these grade separations tie the frontage roads together. This permits a vehicle to get from the frontage road on one side of the freeway to the opposite side without traveling on or crossing the freeway lanes.

One typical project on the Valley Freeway was the construction of a 6.72-mile section just north of

Brownsville by Dodds & Wedegartner, Inc., San Benito, Texas. The contract for almost a million dollars included a grade-separation structure, construction of base, double surface treatment for the two 24-foot freeway lanes, and the improvement of some frontage roads.

Earthwork

In this level area, the cuts and fills for ordinary roadway construction were very light. The principal item

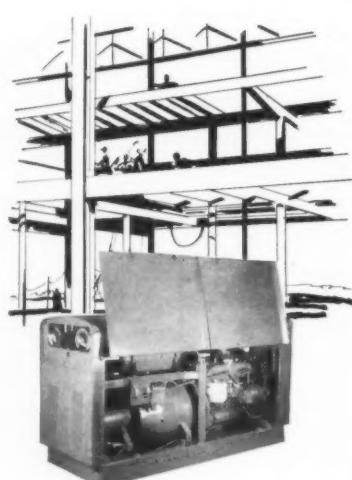
Lincoln engine welders have STAMINA

**9 out of 10 contractors
say Lincoln Shield-Arc's can take it
... and dish it out**

- SLOW SPEED ENGINES for long life
- Heavy-duty, rugged design
- Extra overload capacity
- Close speed regulation and current control

Gasoline engine driven models in 200, 300, 400, and 600 amp sizes.

Diesel engine driven models in 250, 300, and 400 amp sizes.



WRITE FOR SPECIFICATIONS
on Lincoln Shield-Arc
Welders. Bulletin SB-1596
on diesel driven welders
and SB-1537 on gasoline
driven models.



THE LINCOLN ELECTRIC COMPANY

Dept. 1726 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 302



What size pump would you use?

Selecting a pump would be a major problem, if performances were not specified by AGC standards and guaranteed by Rating Plate.

With AGC standards you have a simple, completely reliable way to know the minimum performance of any rated pump under a range of service conditions. Furthermore these standards guarantee you engine power and up-to-date design needed to assure satisfactory service life.

To maintain these helpful standards, demand the AGC Rating Plate on any pump you buy.



Demand this Rating Plate for your protection.

CONTRACTORS PUMP BUREAU

Affiliated with The Associated General Contractors of America
Munsey Building, Washington 4, D. C.

BARNES MFG. CO.
Mansfield, Ohio

C. H. & E. MFG. CO.
Milwaukee 12, Wisc.

CARVER PUMP CO.
Muscatine, Iowa

CHAIN BELT CO.
Milwaukee 1, Wisc.

CONSTRUCTION MCHY. CO.
Waterloo, Iowa

ESSICK MFG. CO.
Los Angeles, Calif.

FOOD MACHINERY &
CHEMICAL CORP.
Peerless Pump Division
Los Angeles 31, Calif.

THE GORMAN-RUPP CO.
Mansfield, Ohio

THE JAEGER MACHINE CO.
Columbus, Ohio

WORTHINGTON CORPORATION, Contractor's Pump Division, Plainfield, N. J.

JACUZZI BROS., INC.
Richmond, Calif.

LEYMAN MFG. CO.
Cincinnati 2, Ohio

MARLOW PUMPS
Div. of Bell & Gossett Co.
Midland Park, N. J.

RICE PUMP & MACH. CO.
Belgium, Wisc.

STERLING MACHY. CO.
Los Angeles, Calif.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 303

paving complete expressway section

Rock asphalt aggregate, shipped 300 miles, proves economical; equipment and men work quickly to finish 6.72-mile section



A Buckeye spreader, attached to the rear of a Ford dump truck, applies 5/8-inch aggregate over a tack coat.



When the roadway had been covered with the required amount of the precoated aggregate, the material was bladed by this Caterpillar No. 12 motor grader.



A Tampo 3-wheel 10-ton roller, following the motor grader, applies the final compaction. This completes the first course of surface treatment.

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al item

of earthwork was the construction of the approach fills for the grade separation. The project included about 235,000 cubic yards of earthwork, more than half of which was borrow from outside the right-of-way.

Two Bucyrus-Erie 1½-yard shovels in the borrow pits loaded a fleet of 5-yard dump trucks that hauled to the job at the rate of about 3,000 cubic yards per day. The fill material was spread in 6-inch lifts by Caterpillar D7 tractor-dozers and Cat No.

12 motor graders, and each lift was compacted by sheepsfoot and 50-ton pneumatic rollers.

Two sets of double sheepsfoot rollers were pulled in tandem by a Cat D8 tractor on this operation. The Tampo 50-ton roller was also pulled by a D8.

Most of the earthmoving operations on the right-of-way were handled by a pair of Euclid S-7 scrapers. These powerful little scrapers loaded unassisted as they made the light cuts

and fills to shape the roadway section. A pair of Cat D7 tractors with LeTourneau LP scrapers also moved some of the dirt. On the grading section, an 8-inch course of select material obtained from the borrow pits provided the subbase on which the caliche base course was built.

Caliche base course

The 8-inch caliche base course was built in a single operation, although the material was laid out and com-

pacted in thinner layers. The caliche was delivered to the job by a fleet of trucks with large dump trailers. Most of those in the fleet were Clement dump trailers or Cable dump trailers pulled by Reo and Chevrolet trucks. The material came from the Edinburg pits of Havana Materials Co., Mission, Texas.

The base material, as dumped on the roadway, was bladed into a windrow by Cat 12 motor graders and thoroughly watered and mixed

Added dependability for materials handling equipment . . . Made-to-order **BHEW HYDRAULIC CYLINDERS**

BHEW custom-built hydraulic cylinders give dependable operational performance wherever they are used. These efficient, close-tolerance cylinders require minimum mounting space; their cost is reasonable; there is no charge for tooling. BHEW builds cylinders to meet your specifications, delivers them on schedule.

BHEW CYLINDER FEATURES:

Standard and special designs available. • Double or single acting and telescopic. • 1½" to 8" bore. • Strokes up to 156". • Smallest possible O. D. and retracted O. A. length. • Oil Cylinders with 1,500 psi or 3,000 psi working pressure, pneumatic up to 150 psi. • Cup-type ring-type or O-ring construction. • Choice of mounting.



- 1. Honed steel cylinder.
- 2. Full double-sealing "U" cup packing.

Furnished in a wide variety of mountings and anchor brackets.

Our engineers will be happy to work with you on any cylinder problems you may have. Without charge, of course.

Send us specifications of your requirements, for full information.



LIMA ROADPACKER . . . The cost-cutting vibratory compactor— proved on turnpike jobs

This is the hard-hitting, high-capacity machine that penetrates deeper—finishes a 13' width in one to three passes.

On this Ohio Turnpike job near Cleveland, Ohio, the LIMA Roadpacker is compacting a bank run gravel sub-base to an 8" high-density thickness. The LIMA Roadpacker's maneuverability was demonstrated efficiently on this job which required compacting operations in widely scattered sections—the problem of transporting cumbersome equipment and the duplication of units was eliminated.

Course aggregate for macadam bases up to 12" thick can be spread in a single layer, then uniformly compacted to final density

over a 13'-1" width with the LIMA Roadpacker.

Single spread, which is permissible only with the vibratory method, reduces material handling by one-half or more—it eliminates backtracking of spreading equipment and contour shaping is needed only once.

The action of the vibration "runs in" screenings to full depth of macadam by only three operations. Much of the labor formerly required to spread, broom and roll is eliminated. The versatile LIMA Roadpacker performs with equal efficiency on both full-width and widening jobs.

Here's how the LIMA Roadpacker speeds up paving operations.

- Drives to job at 30 MPH.
- Compacts equally well traveling forward or reverse—no deadheading or turning around when two passes are required.
- Covers a 13'-1" width, one-half of a two lane road.
- Operator can easily fold end shoes for

narrower working widths or for highway travel. Shoes are raised and lowered hydraulically.

- Low maintenance—all working parts are completely enclosed, can even operate under water or dirt. Shoes are driven hydraulically and are pressure-lubricated.

A fact-filled 4-page folder tells how the new LIMA Roadpacker will help you make more paving profits. Write for your copy today.

B H E W

Benton Harbor Engineering Works, Inc.

622 Langley Avenue St. Joseph, Michigan

For more facts, use Reader-Reply Card opposite page 18 and circle No. 304

APRIL, 1957

LIMA

SHOVELS • CRANES
DRAGLINES • PULLSHOVELS



BALDWIN-LIMA-HAMILTON

Construction Equipment Division—LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation

Hamilton • Loewy-Hydropress • Modem • Pelton • Standard Steel Works

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305

(Continued from preceding page)



Precoated aggregate, shipped 300 miles from the Uvalde Rock Asphalt Co., arrives at the rail siding. A Bucyrus-Erie crane with a Blaw-Knox clamshell bucket transfers the aggregate to a Ford dump truck for the haul to the roadway.

before it was laid out. A CMC pump powered by a Hercules engine pumped water from a drainage ditch on the right-of-way to the water trucks hauling to the roadway.

When the material had been brought up to optimum moisture content, it was laid out in thin layers and rolled with pneumatic-tire rollers. As the final layer was brought to exact grade, it was rolled by a Tampo 10-ton 3-wheel steel roller to complete the base construction. On each of the main freeway lanes, the base course was built to a width of 38 feet. This provided for a 24-foot paved roadway with a 10-foot shoulder on the outside and a 4-foot shoulder on the inside.

Rock asphalt surfacing

A prime coat of MC-1 cutback asphalt was applied to the finished base at the rate of 0.2 gallon per square yard as soon as possible after the final rolling. This prime was applied by a 1,250-gallon Etnyre distributor mounted on a Diamond T truck and equipped with a very long spraybar that made it possible to cover the entire 24-foot width with a single shot. The prime was allowed to soak into the base before the surface treatment began.

The primed base was carefully swept with a Grace broom pulled by a Clark airplane tow-tractor to remove all the dust and dirt that had accumulated. The airplane tow tractor and several other similar small tractors worked very well on the sweeping and rolling operations. They were speedy, powerful enough, and turned easily on the roadway without disturbing the surface.

To start the surface treatment, the Etnyre distributor applied a tack coat of OA-135 asphalt to the 24-foot primed base at a rate of 0.12 gallon per square yard. This was covered immediately with the first course of rock asphalt aggregate. This first application consisted of $\frac{3}{8}$ -inch material applied from dump trucks by a Buckeye spreader with an 11-foot box at a rate of one cubic yard of material for 40 square yards of roadway.

A section ranging from a quarter to half a mile was worked at one time. The distributor started and completed each section on a strip of paper to provide a sharp cutoff and prevent overlap. When the aggregate had been applied, the section was carefully bladed by a Cat 12 motor grader and rolled by a shop-built rubber-tire roller pulled by a Shop Mule tow tractor. On the final pass, the grader carried a very light windrow across the roadway to provide a finished surface as near perfect as possible. This was rolled by the 10-ton Tampo steel roller to give a flat, smooth riding surface.

A second application of rock asphalt was made by the same methods and equipment used for the first. The second course of the surface treatment received a slightly heavier application of asphalt and a much lighter application of a finer grade of the aggregate. This course was spread at a rate of 1 cubic yard of material to 120 square yards of roadway.

The rock asphalt came from Uvalde Rock Asphalt Co., Inc., San Antonio, and was shipped by rail in flat bottom gondolas. The cars were unloaded at a siding near the job site by a Bucyrus-Erie crane, which transferred the material directly to a fleet of dump trucks.

Since the rate of application on the road was based on truck measurements, it was necessary to have all the trucks calibrated and to have them always filled level. Workmen with hand shovels spread each load on the trucks to get this result.

Aggregate is soaked

The loaded trucks went from the

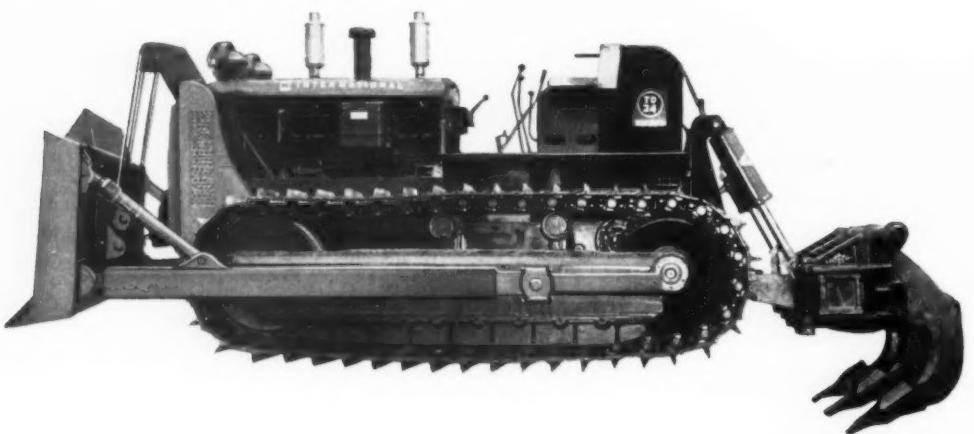
CONTRACTORS AND ENGINEERS

HERE'S HOW TO MOVE MORE EARTH AT LESS COST



ATECO 4-wheel scrapers get heaping loads quickly. Loading and ejection are positive. High road clearances and elimination of overhead structures and dead-weight auxiliary frames cut tractor wear. Center of gravity is

lower—stability is increased. Initial cost is low. See your IH dealer or write us for details on scrapers from 6 to 10 cubic yard capacity.



Many contractors are moving rock at dirt prices by preparing the area with the tractor-mounted Greenville Rock Ripper. This big unit rips rock, frozen earth, and other tough materials to depths of 24". The shanks swivel 30°. This swivel action, combined with the special shank contour, exerts a live, prying action that

wedges into and splits rock like a jackhammer. Ripper is always in position while the tractor remains free for bulldozing and pushloading when needed. Greenville rippers are available for IH TD-14, TD-18, and TD-24 tractors. See your IH dealer or write to us.



GREENVILLE STEEL CAR COMPANY

ATECO DIVISION

Greenville, Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 306



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APRIL



A workman, using a Gorman-Rupp pump, waters down a load of aggregate picked up at the rail siding by a Ford dump truck.

siding to a nearby bridge over an irrigation ditch. Here, a Gorman-Rupp pump pumped water from the ditch to a hose used by a workman to wet down the load of aggregate. The trucks then proceeded to the roadway to spread the material.

One road crew with a distributor, a spreader, one motor grader, one rubber-tire roller and one steel-wheel roller together with trucks and other supporting equipment, placed about a mile of the 24-foot pavement per day under favorable conditions.

Overpass bridge

The overpass bridge included in this contract was a four-span continuous girder structure with concrete piers and abutments, steel girders, and a concrete deck. The piers and abutments were founded on 16-inch Armco piles. Each pier consisted of four 30-inch round columns on 6x6-foot concrete footings resting on the piles.

The two 26-foot roadways of the bridge were surfaced with 3 inches of cold-mixed asphaltic concrete. The roadways were separated by a concrete median 4 feet wide and 6 inches high. On each side of the bridge was an 18-inch curb carrying a steel railing. The abutments were placed on the fills, and the slopes under the bridge from the abutments to the roadway beneath were paved with 4 inches of reinforced concrete.

The Valley Freeway is being constructed by the Texas State Highway Department to provide an expressway link between many of the cities and villages of the Valley as well as to improve access to the area from the north and east. In bypassing some of the most heavily built-up areas, the expressway will reduce the traffic congestion and speed up travel in this heavily populated area.

Personnel

This project is being constructed in District 21 of the Texas State Highway Department. District engineer J. F. Snyder supervises all work in the district. J. C. Herrera was resident engineer in charge of this portion of the freeway work. Jed N. Robinson is construction engineer for the department, and D. C. Greer is State Highway Engineer.

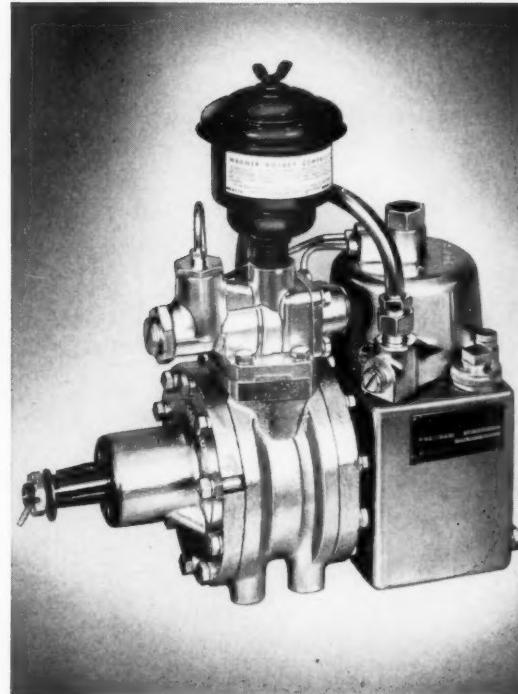
Supervising the base and paving operations for Dodds & Wedegartner, Inc., was superintendent B. C. Price. The superintendent of the bridge crew was W. A. Velten.

THE END

"I'll just never get used to these native workmen, I guess."



THE WAGNER ROTARY COMPRESSOR IS IMPORTANT IN MAKING WAGNER AIR BRAKES SAFE...EFFICIENT...ECONOMICAL!



Actual field analysis shows that Wagner Rotary Air Compressors are safe—efficient—economical. They provide plenty of air for any emergency...have fast air recovery...and consistently keep service costs low because of exceptionally long life and easy, infrequent maintenance.

Wagner Rotary Air Compressors, available in either 9 or 12 C.F.M. capacity, air or water-cooled, are standard with every Wagner Air Brake System. These Compressors are the only compressors that employ true rotary motion, with minimum friction loss. And because oil is separated and cooled before air is discharged, air temperature is reduced and formation of carbon, sludge and varnish in air lines is prevented.

But check all the cost-saving features of complete Wagner Air Brake Systems for yourself. A copy of Catalog KU-201, giving full information, is yours for the asking without cost or obligation. Write for your copy, today! And remember, when ordering new equipment, be sure to specify Wagner Air Brakes.



WAGNER MOISTURE EJECTION VALVE

is one of many important Wagner Air Brake Components available to you. This fully automatic valve keeps air reservoir clean and dry.

Operating in the 15 to 20 p.s.i. air pressure range, it ejects moisture with each average brake application without causing a noticeable drop in tank pressure. May be mounted in any convenient location. No heating element is needed, as this valve cannot freeze in open (exhaust) position. Installation is quick and easy.

Wagner Electric Corporation 6364 PLYMOUTH AVENUE • ST. LOUIS 14, MO., U.S.A.

Wagner Air Brake Systems

WAGNER ROTARY AIR COMPRESSOR

Heart of the Wagner Air Brake System



LOCKHEED HYDRAULIC BRAKE PARTS AND FLUID • NeRoL • CoMoX BRAKE LINING • AIR BRAKES • AIR HORNS • TACHOGRAPHS • ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 307

Manufacturer memos

Jack E. Davis, assistant to the president of the Seaman-Andwall Corp.



Seaman-Andwall names

Jack E. Davis has been appointed assistant to the president of the Seaman-Andwall Corp., Milwaukee, Wis.

Davis, the former works manager of the Colson Corp., is a mechanical engineering graduate of Illinois Institute of Technology, and was an instructor of aviation engineering there during the early years of World War II.

I-H appoints R. G. Greer; promotes Leslie J. Lange

Ralph G. Greer has been appointed manager of sales for the Construction Equipment Division of the International Harvester Co., Chicago, Ill. Greer takes the post held by the late I. P. Payne. A member of the company for over 20 years, Greer was formerly manager of the firm's Washington, D. C., office, and most recently, assistant manager of sales for

Ralph G. Greer, manager of sales for the Construction Equipment Division, International Harvester Co.



the Construction Equipment Division.

At the same time, Leslie J. Lange was named to succeed Greer. Lange was formerly the division's general supervisor of sales development.

Joyce-Cridland promotes

Three members of the Joyce-Cridland Co., Dayton, Ohio, have been named to new positions. John M.

Miller is the new assistant general sales manager, serving as first assistant to Huston Brown, company president. Robert M. Tormey has been named sales manager of the Jack Division, and Ralph Nyborg has become sales manager of the Materialift Division.

Thor creates new position, transfers branch managers

William J. Laughlin has been named industrial division manager of the Thor Power Tool Co., Aurora, Ill. Laughlin, formerly the firm's Los Angeles branch manager, will make his headquarters at the company's executive offices in the Prudential Building, Chicago, Ill. He will supervise all Thor industrial air and high frequency electric tool sales throughout the firm's domestic and export branches.

At the same time, Clarence H. Gabriel, Denver, Colo., manager, will succeed Laughlin as Los Angeles, Calif., manager. Mark A. Sorenson, Philadelphia, Pa., manager, succeeds Gabriel at Denver; John L. MacDonald, Newark, N. J., manager is transferred to Philadelphia, succeeding Sorenson; and Albert C. Cheswick, Houston, Texas, service engineer, has been promoted to branch manager at Newark, N. J., succeeding MacDonald.

Littleford appoints Brent division sales manager

Edward Sterling Brent has been appointed sales manager of the Road Maintenance Equipment Division, Littleford Bros., Inc., Cincinnati,

Edward Sterling Brent, the new sales manager for the Road Maintenance Equipment Division, Littleford Bros., Inc.



Ohio. Brent succeeds L. W. Glaser, the new sales director in charge of the southern states territory.

In his new position, Brent will be in complete charge of all Littleford equipment sales and policies, and will supervise the work of the firm's United States, Canadian, and export dealers. Since joining the company in 1933, he has held the positions of sales correspondent, sales engineer, and most recently, assistant sales manager in charge of field operations.

Detroit Diesel news

D. H. Briggs has been appointed service manager of the Detroit Diesel Engine Division, General Motors Corp., Detroit, Mich. Briggs joined General Motors in 1935, and was engaged in experimental work on Detroit Diesel models for several years before production started. Prior to his present appointment, Briggs served as service representative and assistant service manager.

B. W. Patrick, former zone sales manager in New York, succeeds Briggs as assistant service manager.



MANUFACTURING COMPANY
Port Deposit, Md.

• COAL BARGES • FLOATING CRANES • PILE DRIVERS • TUG BOATS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 308



F. Burrows Esty, (left) vice-president and chief engineer of the Wisconsin Motor Corp. At right is Ray J. Fellows, vice-president and sales manager.

Wisconsin Motor Corp. names vice presidents

The Wisconsin Motor Corp., Milwaukee, Wis., has appointed two new vice presidents, F. Burrows Esty and Ray J. Fellows. Esty, who has been with the firm since 1948, has been chief engineer since 1955. Fellows, a member of the company since 1938, has served since 1954 as domestic sales manager. As vice presidents, both men will continue to occupy their previous positions as chief engineer and sales manager, respectively.

Minneapolis-Moline names officers and directors

The board of directors of the Minneapolis-Moline Co., Minneapolis, Minn., elected W. C. Mac Farlane, president, to the new position of vice chairman of the board, and Henry S. Reddig, senior vice president, to the office of president.

All other incumbent officers were re-elected, and William F. Foss, managing director of the firm's affiliated company in Turkey, was elected controller. These elections were all made at the board of directors meeting following the annual shareholders' meeting at the firm's general offices. At the shareholders' meeting, 12 men were elected to the firm's board of directors.

Chain Belt division forms three districts

The Rex Construction Machinery Division of the Chain Belt Co., Milwaukee, Wis., has formed three new districts—the central territory, the Ohio Valley territory, and the Rocky Mountain territory, with offices in Chicago, Ill., Cleveland, Ohio, and Denver, Colo., respectively.

District sales manager of the central territory is Richard Leek, former assistant sales manager. Roy McNeil, district sales representative of the Ohio Valley territory, previously worked on special assignment in district sales representation. Edwin Extract, formerly in sales training and district sales representation, is the district sales representative of the Rocky Mountain territory.

Roebling's Sons appoints

Earl A. Frazier is the newly appointed New York District sales manager for the Wire Rope and Aircord Division of John A. Roebling's Sons Corp., Trenton, N. J. He will be in charge of sales activities covering the New York, northern New Jersey, and New England territories.

U. S. Steel appoints

The United States Steel Corp., Pittsburgh, Pa., has named R. A. Shaw, Sr., as executive assistant to the president of its American Bridge Division. Previously Mr. Shaw was treasurer of this division and an assistant secretary of the corporation.

O. E. Barnum, former treasurer of U. S. Steel Supply Division, succeeds Shaw as treasurer of the American Bridge Division.

David White news

Charles Seeley has been appointed district sales manager for the David White Instrument Co., Milwaukee, Wis., manufacturers of surveying instruments. Seeley will work out of the

firm's Detroit, Mich., office.

At the same time the firm and its camera division, Realist, Inc., have moved to new quarters at 2051 N. 19th St., Milwaukee.

M-H-F names president; appoints vice presidents

Albert A. Thornbrough has been appointed president of Massey-Harris-Ferguson, Inc., Racine, Wis. Thornbrough was formerly a vice president and director of Harry Ferguson, Inc., Detroit, Mich., and was recently appointed president of Massey-Harris-Ferguson, Ltd.

At the same time, J. H. Shiner and H. A. Wallace were named vice presidents. Shiner was formerly with the Ford Motor Co. as sales manager.

Albert A. Thornbrough, newly appointed president of Massey-Harris-Ferguson, Inc.



Wallace served with the Allis-Chalmers Mfg. Co. and Ethicon, Inc.

Galion Allsteel appoints

Howard Marriott has been made Eastern regional sales manager of the Galion Allsteel Body Co., Galion, Ohio. In his new post, Marriott will coordinate the sale of dump bodies, hoists, and hydraulic tailgates.



WIRE ROPE AT WORK

Now spanning the Delaware is the great Walt Whitman Bridge linking South Philadelphia with Gloucester City, N. J. The \$90,000,000 structure, opening in 1957, is a project of the Delaware River Port Authority. It features a main suspension span of 2,000 ft—the eighth-longest yet built. At the midpoint of the span the roadway has a clearance of 150 ft above mean high water.

An interesting phase of the long, tough construction job was captured in the photograph above. As the picture was taken, one of the last of the truss-type floor beams was rising above the water, being lifted into position by strong, sinewy Bethlehem wire ropes. These steel cables handled the truss with ease, though it weighed in the neighborhood of twenty-two tons. The lift was a typical one for Bethlehem ropes, which can always be counted on to bring the load home.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

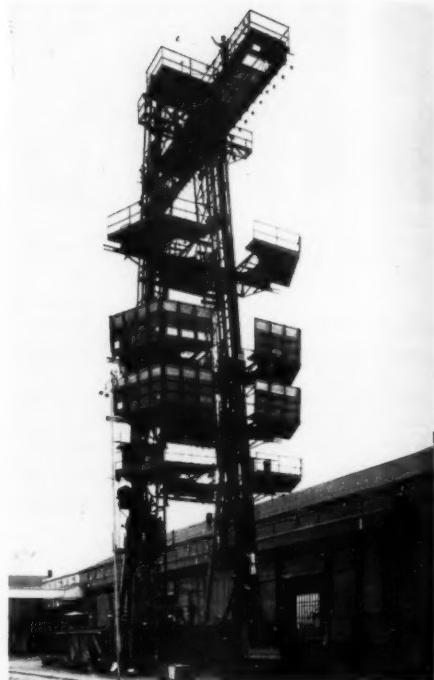
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING



For more facts, use Reader-Reply Card opposite page 18 and circle No. 309

Missile service tower that tilts undergoing tough tests by Army

The 120-foot-high guided missile service tower, designed and built by the Noble Co., has five elevator work platforms, each one capable of holding 2,500-pound loads. The tower moves under its own power on two parallel sets of standard-gage railroad tracks.



McGOWAN LIGHT and HEAVY-DUTY Pumps



Here's the answer to pumping problems!

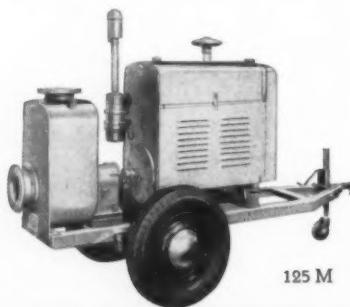
Flash floods . . . water main breaks . . . continuous seepage . . . or underground water . . .

In these and similar instances where LOST TIME MEANS LOST PROFITS, your first thought is how to keep those men on the job! That's when it feels mighty good to know that a McGOWAN HEAVY-DUTY DIAPHRAGM PUMP is standing by for emergencies. You can stop worrying—mud, muck, sludge—and even downtime—are no longer a problem.

when a McGowan Pump is on the job



Use your Classified Telephone Directory to contact your nearest McGowan distributor for complete details, or write or wire direct to



McGOWAN PUMPS Dependable Pumps Since 1852
DIVISION OF LEYMAN MANUFACTURING CORP., 58 Central Ave., Cincinnati 2, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 310

A unique guided missile service tower that can tilt from a vertical to a horizontal position is now undergoing tests by the U. S. Army Corps of Engineers at Patrick Air Force Base near Orlando, Fla. Project engineer William H. Griffith of the Noble Co., Oakland, Calif., designed the mast from idea he used in an earlier project he developed for oil field drilling operations. The test stand, which Noble also built under the supervision of the Corps of Engineers, will be used in the research and development program of the U. S. Army Ballistic Missile Agency.

The tower stands 120 feet high, has a base span of 24 feet, weighs 340,000 pounds, and moves under its own power on two parallel sets of standard-gage railroad tracks. In tests con-

ducted by the Corps of Engineers, the whole tower was tilted from its usual vertical position to horizontal by self-contained motors, and was then raised back to its original position by the same power source. In a vertical position, the tower can withstand gale forces up to 75 mph.

Tower operation

Raising and lowering the tower is an impressive project, considering the mass of equipment and machinery in and on the structure. Five elevator work platforms, spaced at vertical intervals, are capable of holding 2,500-pound loads. One hammerhead crane and trolley with two 15-ton hoists and two passenger elevators complete the tower's upper construction.

OVERMAN STONE AND BITUMINOUS SPREADER



THEY USE 'EM EVERYWHERE

. . . IN KENTUCKY

The Kentucky State Highway Department is one of the many states keeping their roads in tip top condition at a minimum of expense with the Overman Spreader. This spreader is especially suitable for any city, county, or highway department, convenient for small patching jobs—capacity for a complete resurfacing job.

WRITE
FOR
BULLETIN
TODAY

I. J. Overman Mfg. Co.
BOX 896 MARION, IND.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 311

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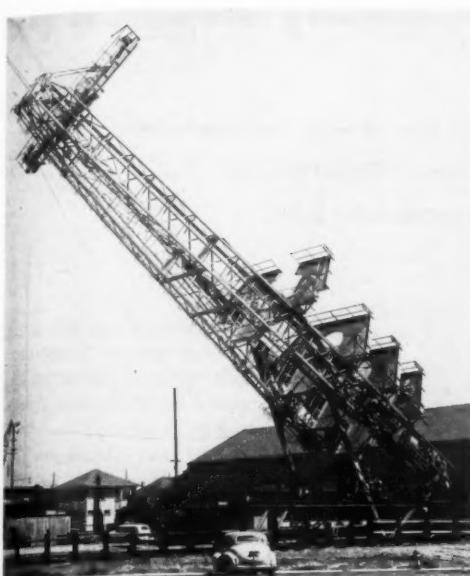
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APRI-

Self-contained motors lower tower from vertical to horizontal position; each of five movable elevator work platforms carries 2,500-pound loads



Self-contained motors tilt the tower from a horizontal to a vertical position.

work platforms provides 360 degree access to the missile, and each moves vertically to any desired point. The platforms, by splitting in the middle, open horizontally to receive the missile, then close snugly around the outside of the object. A number of adapter plates, used to accommodate missiles of varying diameters, tailor fit the work platforms to the missile being serviced.

All of the work platforms are served by two passenger elevators, one on each leg of the mast. Each elevator

will go automatically to the platform selected by the operator and stop level with it, regardless of its vertical position.

After being assembled and tested at the Noble Co.'s Oakland plant by the builders and the Corps of Engineers, the tower was dismantled and shipped in a train of 14 freight cars to Florida. Arriving at Florida, the tower was again reassembled and tested by both parties, before it was turned over to military authorities.

THE END

The 30×60×10-foot base section houses all the switch gear, an electric control room, complete air conditioning and electric generating equipment, a laboratory and office space for the working crew, and the power source to raise and lower the mast. The control of the tower and its movements is held by a single individual, who operates it from a console panel on a flying bridge atop the base section.

Underneath the base section are four rail tracks, each with its own individual motor drive. The complete tower unit travels on rails to and from the missile site, and with the missiles to position them on the firing pad.

Power to operate the tower and its components is supplied by its built-in diesel-electric generator, or can be

taken from an external fixed power source of 120 to 208 volts by plugging it into a special receptacle.

The tower's tilting feature, particularly valuable in Florida during the hurricane season, makes it possible for the tower to be quickly disassembled, and when the danger has past, to be reassembled. The service tower is relatively portable, as it can be taken apart and put back together again much like an erector set. Field assembly takes three to five days.

Positioning missiles

The tower is used to handle large guided missiles into place for firing, and to provide access to all parts of the missile for servicing and adjusting after it has been positioned.

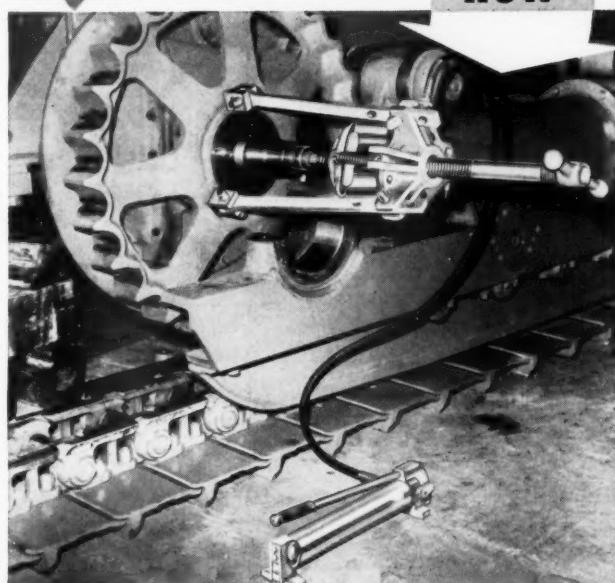
Each of the five completely movable

EVER PULLED A CRAWLER TRACTOR SPROCKET WITH 4 PUMP STROKES?



HYDRAULIC UNITS ARE DOING IT REGULARLY IN SHOP OR FIELD

HERE'S HOW



A. C. sprocket being removed with OTC Power Twin hydraulic ram and adaptors.

Contractors report saving hours, pulling and installing tractor sprockets with portable OTC hydraulic pullers and attachments. Regardless of make, one man with an OTC unit can pull and install a sprocket or track king pin in minutes using an OTC hand or electric pump.

OTC Power Twin hydraulic 50 or 100 ton ram, with simple accessories also remove and install bearings, gears, sheaves or pulleys on all makes of equipment, without damage to the parts—pay for themselves in time saved on one job.



Ask for free new Contractors and Tractor Manual.

OWATONNA TOOL COMPANY

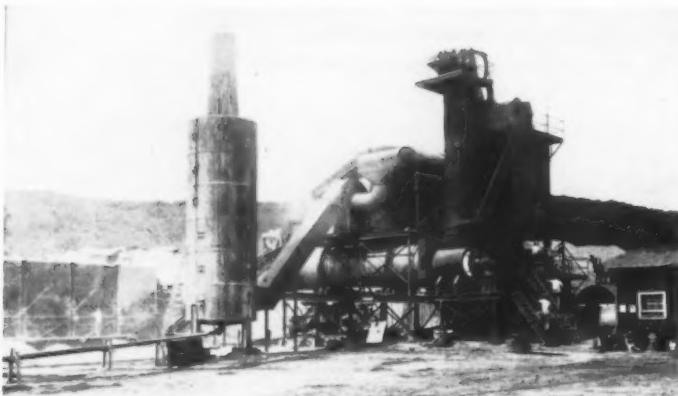
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APRIL, 1957



Naylor 6-inch drain pipe, lower left, removes water from contractor-built dust collector of Hetherington & Berner asphalt plant. Aggregates, stored in bins, left, are transferred to 30-foot dryer by inclined conveyor belt.

High-capacity hot-mix plants

**Best day sees 2,000 tons of material produced
in 11 hours; more than 100,000 tons of
asphaltic concrete needed for job**

LET THIS ACTUAL JOB REPORT GUIDE YOUR PLANNING FOR THE COMING ROAD PROGRAM



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HERE'S WHAT
J. B. MICHAEL & CO., INC.
PLANNED IN 1955 . . .

THIS IS HOW
IT WORKED OUT . . .

AN EXCERPT FROM THE
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A NATIONAL PUBLICATION



Too close for comfort? — What appears to be bottleneck at Jersey Spreader (six trucks waiting, top photo) is relieved in less than ten minutes (bottom). Trucks hauling in 2-in. minus stone are emptied in 50 sec. J. B. Michael & Co., Inc. working three spreaders, places 20,000 tons a day! Each spreader marches a mile a day.

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METHOD . . .
WIRE, WRITE
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TRACTOR SPREADER COMPANY
HASBROUCK HEIGHTS, NEW JERSEY

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A 200-ton-per-hour asphalt plant produced the more than 100,000 tons of asphaltic concrete for the largest and longest contract to date of the Massachusetts Turnpike.

The 11-mile job, starting at the New York-Massachusetts state line near West Stockbridge, Mass., actually consisted of two separate segments. The first, 2½ miles long, started at the state line. A section about three miles long separated this segment from the 8½-mile stretch included in the \$10½ million contract handled by B. Perini & Sons, Inc., Framingham, Mass.

Grading

Under the grading phase of the contract, Perini had to move more than 3½ million yards of earth, 2½ million yards of it borrow. Roadway excavation was handled by six Caterpillar DW21 scrapers, two twin-engine Euclid scrapers, and 16 Euclid 17-yard scrapers. The borrow material was loaded by a fleet of eight shovels and hauled to the roadway fills in Euclid bottom-dumps.

The 618,000 yards of rock excavation was also handled by the shovels, which loaded the material to about 20 Euclid rear-dumps and a fleet of Mack dump trucks that were used

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plank on pike's longest stretch

A Mack 12-yard dump truck, capable of holding seven 6,000-pound batches, leaves the H. & B. plant. The Howe scale on the operator's platform weighs aggregates before they are dumped into the pugmill to be mixed with asphalt.



later during the paving operation.

The many outcroppings of rock along the length of the project were drilled by two Gardner-Denver Air-Tracs, two Ingersoll-Rand wagon drills and a Joy wagon drill. Air for the drills was supplied by two Joy 720's, one Ingersoll-Rand 600, one Chicago Pneumatic 500, two Worthington 105's, and one Schramm 105 air compressor. These were hauled to work sites all along the project.

Concrete for such things as bridge abutments, piers, and box culverts along the 2½-mile section beginning at the New York State line was supplied by a Blaw-Knox batch plant set up by the contractor. When work was being done on the 8½-mile section, concrete was purchased from a local source. A total of 37,000 yards of concrete and 8,700,000 pounds of structural steel was required on both sections for the 21 bridges and 4 box culverts included in the contract.

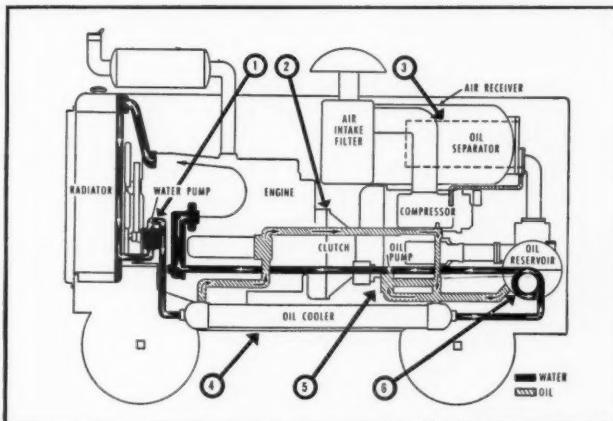
To build up the roadways from the 18-inch-thick course of select borrow material, Perini first placed a 14-inch gravel subbase. This subbase, requiring about 408,000 yards of borrow, was topped with a 2½-inch-thick sand-bound macadam base that was, in turn, covered with a 2½-inch oil

(Continued on next page)

Two NEW Gardner-Denver All-Weather rotary compressors feature the G-D water-oil cooling system

Flow chart shows how Gardner-Denver water-oil cooling system operates

- 1 Water circulating system automatically provides constant operating temperature for both compressor and engine under all weather conditions—hot or cold.
- 2 Clutch eliminates cold-weather "dry-starts."
- 3 Effective oil separator minimizes oil consumption.
- 4 Circulating water cools compressor oil.
- 5 Oil pump provides positive flow of compressor oil.
- 6 Warm water from engine warms up compressor oil before clutch is engaged.



Plus these field-proved features of the Gardner-Denver RP600 and RP900 portables

... Easy Field Inspection ... Thriftmeter Control ... Vibrationless Operation



Model RP125

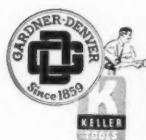


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ROLCOR Industries
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APRIL, 1957.



On the roadway, a Mack batch truck dumps to the hopper of a Barber-Greene finisher that lays a 12-foot width of the surface course. Both binder and surface courses are 1½ inches thick.

(Continued from preceding page)

penetrated macadam base course. These two macadam base courses required about 136,000 tons of crushed stone. Between the oil-penetrated base course and the asphaltic-concrete binder course, a blanket of 9/16 to 7/16-inch keystone was put down. This was topped with the binder and finally the wearing courses of the roadway.

Handling aggregate

The Hetherington & Berner plant turning out a 6,000 pound batch of asphaltic concrete every minute for the paving crew was located in a commercial quarry near West Stockbridge. Here, Perini obtained aggregate for the mix and for the various base courses used to build up the roadways. Sand, stone screenings, 3/8-inch stone, and 3/4-inch stone was delivered by trucks that dumped into four 16-yard bins adjacent to the plant. A Hough front-end loader, with a 1½-yard bucket, also loaded the bins with aggregate obtained from small, temporary stockpiles.

Running beneath the bins, all of which were equipped with Syntron vibrating feeders, was a 24-inch continuous conveyor belt that fed another 24-inch inclined belt loading to the plant's dryer. All four Syntron feeders discharged onto the first belt whenever the binder-course mix was desired. During production of the wearing course, which did not require 3/4-inch stone, only three bins were used.

All aggregate passing over the belts was dumped into the 30-foot-long × 88-inch-diameter dryer to remove moisture and heat the sand and stone. A 12-inch oil burner fired the dryer.

At the burner end of the dryer, aggregate fell through an enclosed chute to a 112-foot-high enclosed bucket elevator. This dumped the heated aggregate into a screening unit consisting of four decks of Deister vibrating horizontal screens located on top of the plant's hopper. The screen, having top and bottom openings of 3/4-inch, 9/16-inch, 3/8-inch, and 5/16-inch, separated the aggregate into sand and screenings, 3/8-inch stone, 1/2-inch stone, and 3/4-inch stone, and deposited each in separate bin compartments.

Asphalt of 85 to 100 penetration,

furnished by Trimount Bituminous Products Co., Everett, Mass., was delivered in 4,700-gallon tank-trailer trucks and pumped into three storage tanks—two with a 17,000-gallon capacity each and one with a 10,000-gallon limit. Asphalt was kept in a fluid state and heated by hot oil circulated through coils inside the tanks. The circulating oil was heated by a Chausse heater equipped with a York-Shepley burner.

A 10-foot-diameter, 28-foot-high dust collector was rigged by the contractor to control the dust during the

operation of the plant. It had two sets of water jets and 40 spray nozzles that continually sprayed the piped-in plant dust with water. A Jaeger 4-inch jet pump brought the water from a nearby reservoir through a Naylor 3-inch Spiralweld pipeline more than 1,200 feet long.

Since the dust from the plant was injected at the base of the collector, it became soaked with water before escaping through the stack on top of the collector. The excess water from the sprays and the water-laden dust fell to the bottom of the collector, was

time: spring 1956 to spring 1957
place: foothills of Colorado Rockies, site of new Air Force Academy
job: move over 4 million yards of murderously abrasive material... plus 400,000 yards of boulders; make cuts up to 60 feet deep... handle 20-yd loads on grades up to 8 percent... hauls up to a mile long
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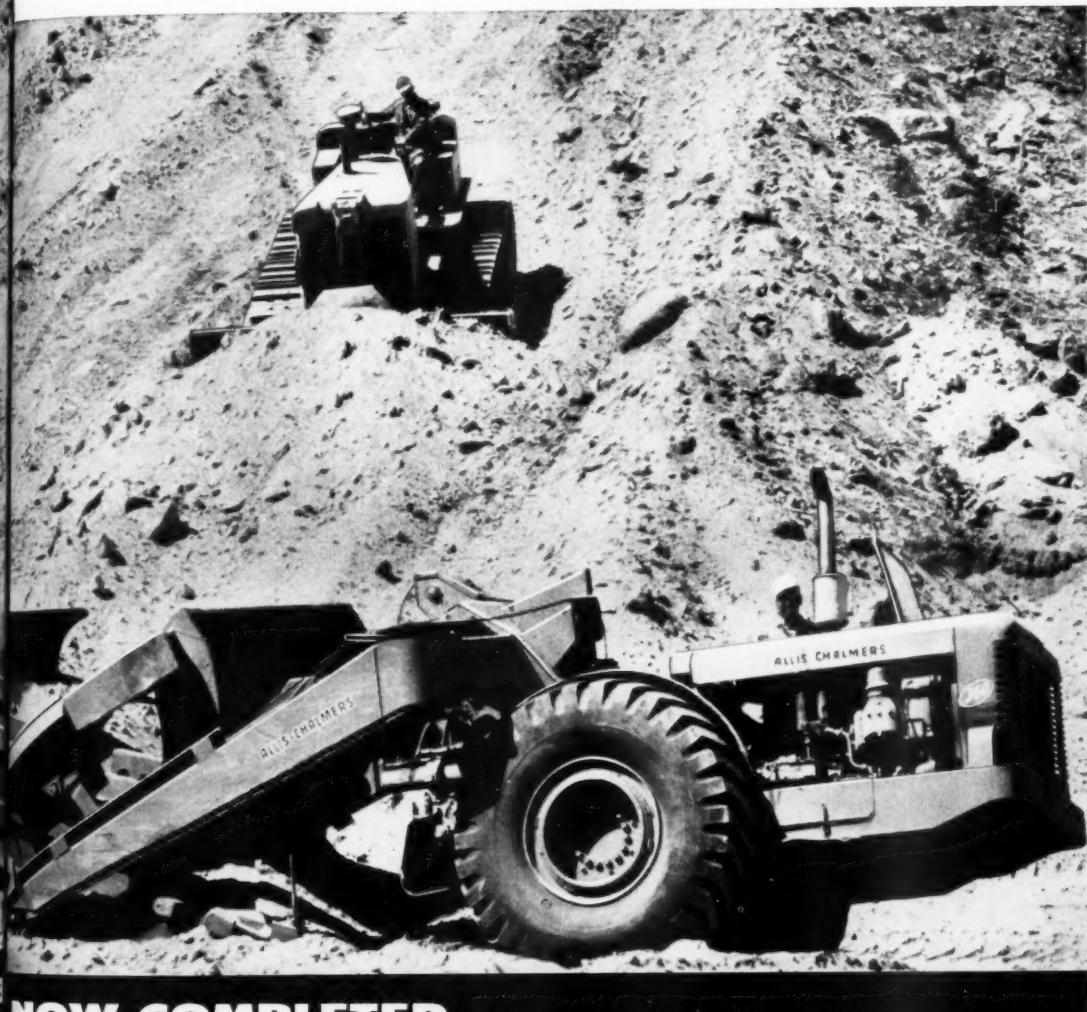
Tough grades, long hauls were part of every cycle on this Colorado Rockies job... but TS-360's consistently moved 20-yd loads fast on haul roads maintained by big Allis-Chalmers Forty Five motor graders.



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The second Barber-Greene puts down a 16-foot width of pavement. The rig, originally covering a 10-foot width, has 4 and 2-foot extensions so that it can cover the inside 4-foot-wide shoulders.



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with Allis-Chalmers construction machinery

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ALLIS-CHALMERS

Engineering in Action

For more facts, use Reader-Reply Card opposite page 18 and circle No. 318

APRIL, 1957

drained off by gravity through a Naylor 6-inch-diameter pipeline, and was deposited in a nearby sludge bed.

Asphalt mixed

Sand and stone aggregates were weighed individually by a Howe scale and dumped into the pugmill where the liquid asphalt was introduced. The binder course asphaltic concrete was mixed for one minute, then deposited in a waiting batch truck. The following ingredients made up the two different 6,000 pound mixes:

Binder course

Sand and screenings	2,340 pounds
3/8-inch stone	420 pounds
1/2-inch stone	820 pounds
3/4-inch stone	2,100 pounds
Asphalt (85 to 100)	320 pounds

Wearing surface

Sand and screenings	3,240 pounds
3/8-inch stone	1,430 pounds
1/2-inch stone	940 pounds
Asphalt (85 to 100)	390 pounds

Six Mack 12-yard dump trucks, each with a capacity of seven 6,000-pound batches, transported the mix to the two Barber-Greene pavers. After picking up a load at the plant, the trucks passed over a Fairbanks-Morse truck-scale weighing platform so that an accurate record of production and mix could be maintained. In one of the contractor's best days, a total of 2,000 tons of asphaltic concrete was turned out over a period of 11 hours.

Paving spread

Both 38-foot-wide roadways, consisting of two 12-foot traffic lanes, a 10-foot outside shoulder and a 4-foot inside shoulder, were given a 1½-inch binder course and a 1½-inch wearing surface by two Barber-Greene finishers. One paver had a 12-foot width while the other, originally a 10-foot model, had 4 and 2-foot extensions added to cover the remaining 16-foot width of the roadway.

Two Buffalo-Springfield 12 to 14-ton double-axle tandem rollers worked directly behind the pavers and two Buffalo-Springfield 17 to 20-ton, triple-axle tandems brought up the rear for final compaction.

Personnel

The entire 123-mile turnpike, extending from State Route 128 near Weston to the New York State line near West Stockbridge, is expected to be open in a few months. A connecting link between this \$239 million project, from the western end of the Massachusetts Turnpike to the New York Thruway, is being built by the State of New York.

Louis L. Capone was the project manager for B. Perini & Sons, Inc.; Stewart McPhail, Joe Kuzio, Anthony Barboza and Ralph Knox were the project superintendents; and R. Bradley is the chief engineer for the contractor.

DeLeuw, Cather, & Brill, Chicago, Ill., was the consulting engineering firm for the Perini contract. Howard, Needles, Tammen & Bergendoff, New York, N. Y., is the general over-all consulting engineering firm for the Massachusetts Turnpike Authority, which has William F. Callahan as chairman.

THE END

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Carrier liable for pipes

THE PROBLEM: Concrete pipes were shipped from Pennsylvania to Connecticut by rail. The initial carrier received them "in apparent good order." They were damaged when delivered by a connecting carrier. Was that carrier liable?

THE ANSWER: Yes. (Ideal Plumbing & Heat. Co. v. New York, N. H., & H. R. Co., 124 Atl. 2d 908, decided by the Connecticut Supreme Court.)

The court noted a distinction between packaged and unpackaged shipments. The pipes, which arrived damaged at the destination, must have been damaged in transit, if they were "in apparent good order" when shipped.



WHY Kensington track LASTS SO LONG

There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON's new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

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Yet, despite all these improvements, KENSINGTON Track Assemblies fit all standard, popular make crawler tractors.

Steel with Stamina. Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

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Width of grouser _____

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Ovoid legal pitfalls

Delayed decisions by the government

THE PROBLEM: A contract for an Indiana federal housing project made it possible for the contracting officer to make adjustments in favor of the contractor, who might run into unexpected underground conditions. The contracting officer was empowered to delegate his functions to someone on the project, but the government caused the contractor a delay by referring the matter to Washington for action by the contracting officer there. Did that constitute a breach of the contract, entitling the contractor to damages?

THE ANSWER: Yes. (Continental Illinois National Bank & Trust Co. of

Subcontractor's bond suit was not prematurely made

THE PROBLEM: A federal statute allows but one year within which a subcontractor might sue a government contractor on his payment bond, the year dating from final settlement of the principal contract. A subcontract specified that no payment—progress or final—should be payable to the subcontractor until payment has been received by the prime contractor from the government. The subcontractor sued on the bond more than 90 days, but less than one year after final settlement between the government and the prime contractor. Was the suit premature since the contractor had not yet received payment from the government?

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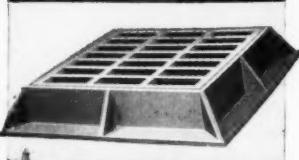
The court decided that the subcontractor provision was void so far as it conflicted with the bond statute. The statute allowed the prime contractor 90 days after settlement in which to pay the subcontractor and required the subcontractor to sue on the bond within one year after the settlement. If the subcontractor were to wait until the prime contractor was paid by the government, his right to sue on the bond might be barred by the one-year limit.

The court noted a practical need for giving "all reasonable financial security to persons who furnish labor and supplies to those performing important" federal contracts.

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CONTRACTORS AND ENGINEERS

Edited by A. L. H. STREET

Attorney-at-Law

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Collapse of defective cap causes injury to worker

THE PROBLEM: To attain the proper elevation for steel building columns, a general contractor placed grout caps on the concrete piers. While carrying a purlin, the subcontractor's crane came in contact with a column, causing the grout cap to crumble and the column to fall. The plaintiff, a steelworker, was injured. Were the facts sufficient to render the general contractor liable, on the theory that the grout cap had been in a defective condition, even though the subcontractor's negligence may have contributed to the accident?

THE ANSWER: Yes. (Little v. Collins Construction Co., 283 S. W. 2d 474, decided by the Missouri Supreme Court.)

There was evidence tending to show that the grout cap would not have crumbled had it been made of concrete instead of brick mortar.

Court defines aggregates

THE PROBLEM: An established rail-way tariff rate covered "transportation of aggregates, principally sand, gravel, crushed stone, earth, clay, soil binder, mineral filler, agricultural limestone, and other similar materials used for construction and maintenance of highways, dams, and general construction projects." Did this statute apply to shipments of sand or gravel individually?

THE ANSWER: No. (Mefford v. Wilson Concrete Co., 77 N. W. 2d 895, decided by the Nebraska Supreme Court.)

Applying a dictionary definition of "aggregate", as a mixture less intimate than in a "compound", the court said that "aggregate" means a "combination of materials."

Sub reimburses contractor for liability to worker

THE PROBLEM: A general contractor was jointly liable with a subcontractor, who had built a wall, for an injury to a steelworker, an employee of another subcontractor. The injured man had fallen to the floor when the apparently solid wall collapsed under his weight. Was the prime contractor entitled to reimbursement by the wall contractor on the grounds that the duty of maintaining a safe situation was on him, and that the general contractor's liability was secondary?

THE ANSWER: Yes. (Soderman v. Stone Bar Associates, Inc., 146 N. Y. Supp. 2d 233, decided by the New York Supreme Court, Kings County.)

The court referred to an earlier

New York case where similar reasoning had been followed. In that case, an owner and a building contractor were declared to be jointly liable for an accident, but the owner was entitled to be reimbursed by the contractor, whose fault more directly caused the accident. (Tipaldi v. Riverside Memorial Chapel, 273 App. Div. 414, 78 N.Y.S. 2d 12, affirmed by the New York Court of Appeals, 298 N. Y. 686, 82 N. E. 2d 585.) In that case, the plaintiff had been injured when a plank fell on him as he walked along a sidewalk abutting upon a building under construction. The courts reasoned that the building owner was liable to the plaintiff, with the contractor, on a theory that an owner is responsible for injuries to a third person where work is dangerous

unless it is carefully performed. But, as the fault lay with the general contractor, he should reimburse the owner for damages awarded to the plaintiff.

Demurrage charges for freight shipments

THE PROBLEM: Unless excused, delays in unloading railroad cars of gravel subjected the consignee subcontractors to demurrage charges. The gravel was used on a government project and the consignee was dependent upon government switching facilities in returning empty cars to the railroad. Could the consignee avoid demurrage charges without proving that the delay was caused by government employees or was



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Delayed decisions by the government

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Edited by A. L. H. STREET Attorney-at-Law

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Court defines aggregates

THE PROBLEM: An established railway tariff rate covered "transportation of aggregates, principally sand, gravel, crushed stone, earth, clay, soil binder, mineral filler, agricultural limestone, and other similar materials used for construction and maintenance of highways, dams, and general construction projects." Did this statute apply to shipments of sand or gravel individually?

THE ANSWER: No. (Mefford v. Wilson Concrete Co., 77 N. W. 2d 895, decided by the Nebraska Supreme Court.)

Applying a dictionary definition of "aggregate", as a mixture less intimate than in a "compound", the court said that "aggregate" means a "combination of materials."

Sub reimburses contractor for liability to worker

THE PROBLEM: A general contractor was jointly liable with a subcontractor, who had built a wall, for an injury to a steelworker, an employee of another subcontractor. The injured man had fallen to the floor when the apparently solid wall collapsed under his weight. Was the prime contractor entitled to reimbursement by the wall contractor on the grounds that the duty of maintaining a safe situation was on him, and that the general contractor's liability was secondary?

THE ANSWER: Yes. (Soderman v. Stone Bar Associates, Inc., 146 N. Y. Supp. 2d 233, decided by the New York Supreme Court, Kings County.)

The court referred to an earlier

New York case where similar reasoning had been followed. In that case, an owner and a building contractor were declared to be jointly liable for an accident, but the owner was entitled to be reimbursed by the contractor, whose fault more directly caused the accident. (Tipaldi v. Riverside Memorial Chapel, 273 App. Div. 414, 78 N.Y.S. 2d 12, affirmed by the New York Court of Appeals, 298 N. Y. 686, 82 N. E. 2d 585.) In that case, the plaintiff had been injured when a plank fell on him as he walked along a sidewalk abutting upon a building under construction. The courts reasoned that the building owner was liable to the plaintiff, with the contractor, on a theory that an owner is responsible for injuries to a third person where work is dangerous

unless it is carefully performed. But, as the fault lay with the general contractor, he should reimburse the owner for damages awarded to the plaintiff.

Demurrage charges for freight shipments

THE PROBLEM: Unless excused, delays in unloading railroad cars of gravel subjected the consignee subcontractors to demurrage charges. The gravel was used on a government project and the consignee was dependent upon government switching facilities in returning empty cars to the railroad. Could the consignee avoid demurrage charges without proving that the delay was caused by government employees or was



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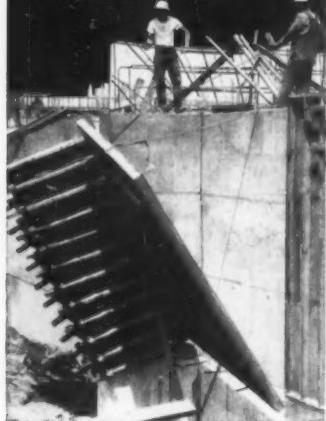
avoid legal pitfalls

otherwise unavoidable?

THE ANSWER: No. (St. Louis-Southern Ry. Co. v. Farrell, 114 Fed. Supp. 486, decided by the United States District Court, Eastern District of Arkansas, Eastern Division.)

Indicating that redress against inequities in applying interstate demurrage tariffs must be corrected by the Interstate Commerce Commission, the court said that—assuming the tariffs and service orders bore more harshly upon particular consignees than upon contractors within the arsenal area where the cars were unloaded—it would not make the tariffs and service orders illegal.

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The court quoted a statement from an opinion of the United States Supreme Court showing that the Uniform Demurrage Code did not attempt to equalize conditions among shippers. To attempt to make individual adjustments would open the door to unjust discrimination and rebates.

Owner is held liable for delay in work

THE PROBLEM: An electric-power-line construction contract specified that the time for performing the contract should be extended to cover a reasonable delay not caused by the owner, but did not hold him liable for damages. It did include delay caused by storm damage and by the owner's tardiness in furnishing poles, staking sheets, and the right-of-way clearance. The owner refused to extend the time for performance unless the contractor should repair the storm damage at its own expense. The contractor, not being liable for the repair under the contract, refused to agree to the condition. Did his refusal waive the right to damage claim against the owner for delaying performance?

THE ANSWER: No. (Northeast Clackamas County Electric Co-Operative, Inc., v. Continental Casualty Co., 221 Fed. 2nd 329, decided by the United States Court of Appeals, Ninth Circuit.)

In this Oregon case, the court quoted from a decision by the Supreme Court of that state, to the effect that where an owner prevents a contractor from performing his contract, by failing to furnish materials or by breach of agreement to do anything else, the contractor can refuse to proceed and sue for the reasonable value of work performed. (Hayden v. City of Astoria, 74 Or. 525, 145 Pac. 1072.)

Fabricated beams are subjected to use tax

THE PROBLEM: Contractors constructed two state highway snowsheds, containing 720 precast reinforced-roof beams, for a price based on the yardage of concrete used in the beams, plus the cost of reinforcing steel. A subcontractor fabricated the beams and loaded them on the contractors' trucks at a fixed charge per beam. The contractors supplied and paid retail sales taxes on the materials. Was the amount paid by the contractors to the subcontractor for labor and mechanical services subject to Washington retail sales tax?

THE ANSWER: No, but the amount was subject to use tax, since it con-

stituted part of the value of the finished beams. (C. V. Wilder Co. v. State of Washington, 297 Pac. 2d 241, decided by the Washington Supreme Court.)

Contractor's control of leased equipment

THE PROBLEM: A demolition contractor hired a crane and operating crew and directed its operation. When sued for rental of the crane, could the contractor counterclaim damages for negligent operation on the part of the crew?

THE ANSWER: No. (B. & G. Crane Service v. Thomas W. Hooley & Sons, 80 So. 2d 369, decided by the Louisiana Supreme Court.)



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The Miller insulating link is capable of standing 100,000 volts of electricity.



THE CONTRACTOR ON A 36-MILE NATURAL GAS PIPELINE fitted fabricated steel pipe skids on two Worthington Blue Brute compressors in order to move them over 90 per cent solid rock terrain in the Blue Ridge Mountains. The compressors, manufactured by the Worthington Corp., Harrison, N. J., operate drills putting down blast holes for the pipeline, scheduled for completion in 1958, which will run between Orsburne Gap, Va., and Maytown, Ky.

Link protects operators from electrical injury

■ An insulating link that replaces standard crane end connections to protect crane operators from injuries caused by the crane coming in contact with overhead electric wires is available from General Machine & Welding Works, Inc. The insulating link is capable of withstanding 100,000 volts, the company reports.

Miller insulating safety links are presently available in 6.8 and 8.5-ton sizes with various types of end connections. Other sizes will soon be available. Every link is laboratory tested and its serial number is recorded in a permanent file.

Equipment coming in contact with energized overhead wires causes 60 per cent of the fatal electrical accidents in crane operations, according to the manufacturer.

For further information write to General Machine & Welding Works, Inc., 1100 E. Second St., Pomona, Calif., or use the Request Card at page 18. Circle No. 82.

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Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service. Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.



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APRIL, 1957



Equipped with a Twin Disc Torque Converter, this 2½-yd. Lorain L-85 Shovel is working on heavy highway grading near New Stanton, Pennsylvania, for Lycoming Construction Co., Williamsport.

Inset (left) is a Cat D337 Diesel Engine-Twin Disc Torque Converter combination which is available in the Lorain L-85.

How torque converters assure higher dividends from your major equipment investments

Twin Disc Torque Converters, dependably and efficiently transmitting power to your heavy-duty machinery, assure you a higher return on your equipment investment, through more work done in less time . . . with a minimum of maintenance and costly downtime.

Here are five profitable, proved reasons why Twin Disc Torque Converters help you to earn more from your other equipment investments . . . such as the Lorain L-85 Shovel pictured above.

1. The torque converter eliminates lugging and stalling . . . permitting engines to work in the maximum efficiency range all the time, delivering constant high-horsepower output—getting more work done.

2. Experience has proved that smooth converter power reduces peak

loads throughout the shovel drive train because fluid within the converter absorbs much of the impact energy resulting from a quick drum speed change . . . thus protecting both driving and driven equipment.

3. When necessary, the torque converter smoothly delivers approximately twice normal torque to the drum, which, at slow digging speed, represents an important advantage in power delivered to the dipper.

4. Cable life is extended since no sharp impact loads ever reach cables through the torque converter. Constant line tension is maintained . . . there is no jerking or snapping.

5. An infinite variety of ratios is available to work with, permitting smooth, accurate control of loads and delicate "inching" or "holding" under power.

Specify a torque converter in your next new machine, or when you re-power. And investigate the advantages of Twin Disc Torque Converters—both single-stage and three-stage—for most other heavy-duty applications from 30 to 1000 hp.

For details, request Bulletin 508 and 135-E (single-stage and three-stage respectively.)

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CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division), Rockford, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 327

**distributor
doings**

**Sound sales and service operation
gives dealer the lead on profits**



Headquarters for many construction machinery buyers in Montana is the headquarters of Westmont Tractor Co. in Missoula. This outlet and the Kalispell branch serve 12 counties in the state and one in Idaho.

Another **AIRPLACO** Concrete Landmark

Airplace Guns Set The Pace For The New "Air-Placed Concrete Era"



Swimming pools in Massachusetts and California; irrigation ditches in Kansas and Colorado; curb repairs and road maintenance in West Virginia and Washington...all over America AIRPLACO concrete guns are creating new construction landmarks (and repairing old ones), efficiently and economically.



AIRPLACO concrete guns and continuous mixers are compact, portable, and very versatile. They're available in sizes to meet every job requirement — from $\frac{1}{2}$ to 7 cu. yards per hour production. You can start now creating new AIRPLACO concrete landmarks, and making bigger profits . . . just write for our FREE catalog or visit your equipment distributor.

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MANUFACTURERS OF ADVANCED DESIGN CONCRETE GUNNING,
MIXING, GROUTING AND SANDBLASTING EQUIPMENT.

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144



At the peak of work on Noxon Rapids Dam in northwestern Montana, a much-needed tractor broke down, but instead of ordering the part from Seattle or San Francisco, the master mechanic telephoned Westmont Tractor Co. at Missoula, Mont., and in a matter of hours the part was at the dam site.

Field service like this, coupled with the same swift service at the headquarters shop, is now expected of Westmont by contractors in the area. One firm, working on a \$3 million project near Missoula, maintained a parts inventory worth only \$20,000 at the job site and depended on Westmont for the remainder of its needs.

The company's service force includes not only field mechanics, but a "good will ambassador" mechanic who handles nothing but equipment maintenance in the 13 counties served by the dealer. One of these counties is in Idaho; the remaining 12 are located in the northwestern portion of Montana.

When it was organized 30 years ago,

Westmont was a construction machinery house exclusively. Today, still headed by president W. J. Gallagher, Westmont has branched out into other fields. Though still mainly a construction machinery house, it serves the mining and timber industries, which are turning more and more to the use of construction machinery, plus the agricultural market for equipment.

Coordinating work of the 70 to 75 people employed the year round at the Missoula and Kalispell outlets are John A. Kok, assistant manager and general sales manager, and Gary Gallagher, sales promotion manager. Operations at Missoula are under Earl Smith, while Howard Hurst, branch manager, takes care of things at Kalispell.

Sales, service tie-in

Vern Lien and O. B. Anderson, resident salesman from the Missoula headquarters, Chuck Young, salesman at Kalispell, and Carlyle Hafer, Butte salesman, comprise Westmont's ag-

no problem to winter patching with-

KOTAL
STOCKPILE MIX

EASY TO WORK WITH . . .
ALWAYS AVAILABLE

For Roads that take extra beatings and must last longer—for roads that need extra attention during freezing and thawing—use KOTAL STOCKPILE MIXES . . . they work better and last longer . . . Repairs are quick and easy to make in all kinds of weather. KOTAL STOCKPILE MIX is tougher, more durable and does not "kick out" under heavy traffic . . . A must for good highway maintenance.

**KOTAL IS A SPECIFICATION MIX IN MANY STATES
ECONOMICAL—SAVES TIME, LABOR AND MATERIAL**

Patches made with KOTAL STOCKPILE MIX eliminates the need for repatching. One KOTAL Patch does the job right — it's permanent!

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Company

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CONTRACTORS AND ENGINEERS

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BOX 42

APRIL 1

**Rough competition in rough country
keeps Westmont Tractor Co. alert
to contractor needs**



Assistant manager and general sales manager John A. Kok works out the details of a sale with local contractor Bud King.

gressive sales force in this competitive territory.

Though competition has been keen—contractors not being too numerous in the area and little construction work being let now that work on large dams in this section of the country has been finished—Westmont's sales have made headway through the years. Credit for the company's performance, according to management and sales personnel, goes mainly to the lines represented by Westmont.

While Caterpillar is the dealership's principal account, the firm handles Gardner-Denver air compressors and drilling equipment, the Pioneer line, Bucyrus-Erie equipment, Broderick & Bascom yellow-strand wire rope, Jenny steam cleaners, Esco buckets and dippers, CMC mixers and pumps, and such smaller equipment as Skookum and Washington blocks.

The dealer's line of small tools and equipment is fast-moving and profitable. Sales of Proto tools, blocks, engine covers, tarpaulins, anti-freeze,

logging tongs and hooks, and chain doubled, tripled, and more than doubled again when new floor displays were added at the Missoula and Kalispell stores. Prior to this, contractors had concentrated their purchases on the larger pieces of equipment when they called on Westmont. But when they realized that the firm stocked many of the smaller items needed on a job, the contractors did all their buying at one central point.

Files aid in servicing

Two card indexes—one carrying a description of the item sold and one listing the customer—are kept for every piece of equipment sold by this dealer. These indexes make it easy for the firm to fill a request for parts. If a contractor needs a final-drive assembly for a Caterpillar D6 that might have been bought as much as six years ago, and the contractor does not have the serial number, personnel at Westmont can look it up.

This shows all the servicing done
(Continued on next page)



California contractor estimates:

Time and labor costs cut 75% with the Remington Stud Driver

Out on the California coast, "Research House" has taken shape. It's an experimental house sponsored by Associated Architectural Publications and the latest tools have been used to build it—such as the Remington Stud Driver.

Contractor Bert Pickney says, "The Stud Driver cuts time and labor costs around 75% in anchoring beam supports, partition sills and furring to concrete. It took us only half a day to install the sills—a 2-day job with bolts. No pre-drilling

is necessary, and sills are set tight! I certainly recommend the Stud Driver to any contractor!"

YOU CAN SPEED ALL STUD FASTENINGS

—light, medium and heavy-duty—with the Remington Stud Driver. It sets both $\frac{1}{4}$ " and $\frac{3}{8}$ " diameter studs in steel or concrete—up to 6 studs a minute either size. The tool is cartridge-powered, portable, ready to work anywhere. Forty styles and lengths of Remington Studs to choose from. Get full details by mailing coupon.

Remington

DUPONT

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DRIVER**

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Foundation exploration costs less with Hoffman Bits because they eliminate guessing about formation structures for quick, accurate job estimates. Exposing only the sharp, hard diamond edges to the work, Hoffman Bits cut rather than scrape. They produce clean, smooth cores at lower footage costs—use less power—last longer. Designed and tested for each application, Hoffman Bits are the answer where core drilling accuracy and economy are important.

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HOFFMAN BROTHERS DRILLING COMPANY
BOX 426 PUNXSUTAWNEY, PA.
SINCE 1902

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APRIL, 1957

distributor doings

by Westmont on that particular machine. About eight people are busy exclusively on keeping the parts records in this up-to-the-minute condition, but Westmont finds that the policy pays off when it comes to giving customers good service. No matter how difficult it may be to acquire a part, an order reaching Missoula headquarters by 6 p.m. can be ready for delivery by 9 o'clock the following morning. Service and maintenance is one of the prime concerns at Westmont, and it is available to contractors from the time a piece of equipment is sold until it wears out. The

big jobs are done in the main shop at Missoula, where there is room for mechanics to work on a dozen D9's at one time. Here, the company has mechanics trained to do expert work on the entire Caterpillar line, some of the best rock-crusher mechanics in the area, and a top-notch shovel erector and serviceman.

Complementing the extensive shop service facilities in Missoula, which are the province of service manager Eric Ericson, and those at Kalispell, where Oscar Moe is service manager, is the field service provided by Westmont. Roving mechanics, with small mobile service units, handle all routine repairs and replacements at the job site.

The caliber of Westmont's service can be gauged by contractor's demand.

Many construction firms have started to let Westmont's mechanics do all the major overhaul work on their equipment during the winter months. One contractor summed up the advantage of this servicing by pointing out that repair costs are cheaper when the work is done by Westmont mechanics and that their job is guaranteed.

Important services

A step toward solving one of the most pressing maintenance problems of a contractor—that of scheduling enough welder hours to keep track rollers, shovel dippers and teeth, and similar parts built up with hardfacing—was made several years ago when Westmont purchased the first of its two fully automatic welding

machines. Now, with Lincoln and Leader machines that can build up track rollers and other parts faster and better than can be done in the field, Westmont feels it is offering contractors one of its most valuable services.

Automatic welding can be done in the company's shop all day at high speed. With the welders, it is possible for Westmont to build up roller tracks, stacking half a day's run on one long receiving rod. A shop welder simply checks the machine from time to time and keeps the feed hopper supplied with powdered metal. The machine does the rest automatically, saving contractors valuable man-hours in the field.

One of the more unusual features of this dealership is the handling of sales of wire rope—one of the least profitable items in the distributor business, considering the weight and bulk of the item being handled. Westmont has what is probably the biggest selection of wire rope outside of Seattle in the Northwest. One big section of the stockroom is stacked high with reel after reel of cable in various sizes, and two men frequently spend an entire day in the sale and distribution of the item. In this part of the building are a hydraulic cutter, a makeup spool for training rope off the drums, a tall rack for the storage of partly used spools of cable, and a

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APRIL,



Pipe made from Beth-Cu-Loy offers economical ways to cross water

Building a road across a stream can be a challenge to the engineer with limited funds to work with. Yet the problem can be handled to produce a result that is functional, attractive and economical all at once! These photographs offer convincing proof.

Both of these installations took advantage of the superior qualities of pipe made from Beth-Cu-Loy galvanized steel culvert sheets. By "superior qualities," we refer, for example, to light weight which makes handling, shipping and installing easier and less costly. And we include the great strength which only steel possesses.

Then there is the flexibility of steel pipe, which permits confor-



mation to grade and alignment, as well as the absorption of impact, vibration and freezing actions. And there's corrosion-resistance, for Beth-Cu-

Loy is copper-bearing steel with the added protection of a heavy coating of rust-defying zinc.

Beth-Cu-Loy culvert sheets conform to the rigid specifications of the American Association of State Highway Officials. If you want additional details about Beth-Cu-Loy, or the names of some of the fabricators who use it in making drainage pipe, just get in touch with the nearest Bethlehem sales office or write direct to our general offices.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 332

This new Lincoln automatic welding machine, building up a track roller from a Caterpillar tractor, is one of the machines in Westmont's shop that helps save valuable man-hours for contractors.

metering device for measuring cable being unreeled. Service is apparent here too, since Westmont makes 150-foot spools of bulldozer control cable available so that as the ends become frayed they can be cut off and the remainder of the cable used out to its full life. Before this practice started, a considerable amount of cable had to be wasted.

Plan inventory

Sales and service worked together for Westmont. One of the best examples of this occurred just before construction started on Noxon Rapids Dam. Long before contracts were awarded, Westmont made plans for what was to be one of its busiest

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One of the dealer's mechanics buffs up a part with a small Black & Decker grinder in the shop. Each special tool has its own place on the rack in the shop.

times. A great deal of extra money was invested in a parts inventory that extended the stock inventory to a 135-day minimum instead of a regular 90-day minimum inventory. Working with this inventory proved so effective that Westmont has worked within a 135-day minimum parts stock ever since.

When the accelerated highway program gets rolling in high gear, Westmont's management believes that the distributor with the biggest parts stock, the best service, and a good supply of new equipment will lead in sales and profits. Westmont plans to be out ahead on all three counts.

THE END

Pioneer names dealer

Flack Equipment Co., Dayton, Ohio, has been appointed a distributor for the line of equipment manufactured by Pioneer Engineering Works, Inc., Minneapolis, Minn. From offices at 1240 McCook Ave., Dayton, and 2565 W. Galbraith Road, Cincinnati, Flack will service the Ohio counties south of and including Mercer, Auglaize, and Logan, and the counties west of and including Logan, Champaign, Clark, Fayette, Highland, and Adams.

Euclid-Tennessee news

K. C. Gravenhorst has joined Euclid-Tennessee Inc. of Knoxville, Knoxville, Tenn., as a sales engineer specializing in the Cedarapids line of equipment, which is manufactured by the Iowa Mfg. Co., Cedar Rapids, Iowa.

Gravenhorst, a specialist in rock crushing and aggregate production, has worked on such projects as the Pennsylvania Turnpike, Alcan Highway, New Jersey Turnpike, and St. Lawrence Seaway.

Detroit Diesel appoints

Griffin Equipment Corp., New York, N. Y., has been appointed a distributor for the marine engines of the Detroit Diesel Engine Division, General Motors Corp., Detroit, Mich. Griffin's area includes New York City, all of Long Island, southern New York State, and the northern half of New Jersey.

APRIL, 1957

Manitowoc names dealers

Depco Detroit Corp., Detroit, Mich., has been named a distributor for the complete line of cranes, shovels, trench hoes, and draglines manufactured by the Manitowoc Engineering Corp., Manitowoc, Wis. From offices at 15721 Telegraph Road, Depco Detroit will cover the entire state of Michigan, excluding the upper peninsula.

The firm has appointed the Chesapeake Supply & Equipment Co. a distributor of their complete line of shovels, cranes, trench hoes, draglines, and mobile cranes in the Baltimore, Md., area.

From offices in Baltimore and Hy-

attsville, Md., and Dover, Del., Chesapeake will serve the Baltimore, Dover, and Washington, D. C., areas, as well as parts of Virginia and West Virginia.

Wylie distributorship increased by Koehring

The Koehring Co., Milwaukee, Wis., has appointed the Robert J. Wylie Co. of St. Paul, Minn., as a sales representative for public utilities and special industries in Minnesota. Wylie will also represent products manufactured by Kwik-Mix Co., a division of Koehring Co., and C. S. Johnson Co., a Koehring subsidiary. Equipment to be offered includes Koehring

What about hydro-flation?



Hydro-flation increases weight of 208 hp, 31,700-lb. Tournatractor by nearly 10%. Increased traction and drawbar pull, plus decreased tire slippage and decreased tire wear are the results.

because the solution counterbalances as the wheel rotates, you lose practically no power on the haul. Hydro-flation also cuts slippage and tread wear, and reduces need for frequent re-inflation due to pressure loss.

Calcium chloride prevents freeze-up

The liquid usually used for hydro-flation is either plain water or a mixture of calcium chloride and water. The calcium solution will not freeze, even in sub-zero temperatures, and it will not injure rubber. Five pounds of calcium chloride per each gallon of water protects against freezing in temperatures to 40° below zero.

Simple to do

Hydro-flation is simple. First, thoroughly mix the calcium chloride with water. Follow recommendations of the tire manufacturer—usually three to five pounds of the chemical are added to each gallon of water. Next, jack up wheel of machine to remove all weight from tire. Then, rotate tire until valve stem is at top and perpendicular to ground. Remove as much air as possible. At-

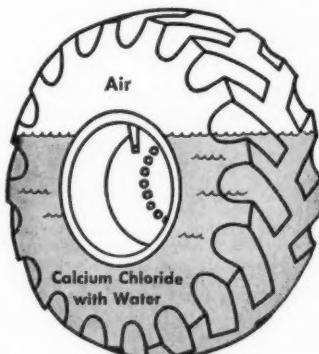
tach nozzle of hydro-flater to valve stem. Remaining air will escape as solution is pumped in.

When solution reaches valve stem level, remove nozzle and inflate tire with air to manufacturer's recommended pressures. On construction equipment, tires should not be filled with liquid above 75% capacity. Valve should be at highest position when checking air pressure.

One word of caution if you use the recommended calcium chloride solution instead of just water . . . be sure to obtain tubes with special rubber-sealed base valves. This type valve will prevent separation of the rubber valve base and the metal. Special corrosion-proof gauge should be used for checking pressure, too. Equipment for the liquid inflation can be obtained from an agricultural implement dealer or any large tire distributor or dealer.

Tournatractor—Trademark Reg. U. S. Pat. Off. G-740-OP-bw

Free copies of this article can be obtained by writing LeTourneau-Westinghouse Company, Peoria, Illinois. Please state quantity desired.



With valve stem in top position, fill tire with solution up to level of valve stem. Tire will then be filled to within approximately 75% of capacity. Complete inflation to manufacturer's recommended pressure with air.



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Reader-Reply Card opposite page 18 and circle No. 333

distributor doings

excavators, hauling equipment, and concrete pavers, Kwik-Mix mixers and the Moto-Bug power wheelbarrow, and Johnson concrete batching and cement handling installations.

Wylie already handles Koehring product distribution to all railroads in Minnesota and upper Michigan.

Littleford appoints

The Ray-Brooks Machinery Co., Montgomery, Ala., has been appointed a dealer for Littleford Bros., Inc., Cincinnati, Ohio. The dealer will handle the complete line of Littleford road maintenance equipment.

including the Heater-Planer, utility spray tank, paver-spreader, and small paving tools.

William F. Rechtin, service manager for Littleford, conducted the first service school for dealer service. The three-day conference on service techniques for the firm's equipment was held February 18 to 20 at the newest of Littleford's plants in Cincinnati. Technical explanations and demonstrations were given on the firm's line of equipment.

Foundation Equipment, U. S. dealer for Canadian firm

A complete line of quick-coupling aluminum pipes, manufactured by Major Aluminum Products, Ltd., Vancouver, British Columbia, is being

distributed throughout the greater New York and Long Island, N. Y., area by the Foundation Equipment Corp., Long Island City, N. Y. The pipe, produced in 20-foot lengths of 3, 4, and 6-inch diameters, can be used for air, water, and oil.

Foundation Equipment is also storing fittings, adapters, headers, etc.

Concrete Transport news

Concrete Transport Mixer Co., St. Louis, Mo., has appointed four distributors to handle the line of Rocket truck mixers. The George W. Whitehead Co., Buffalo, N. Y., will cover the western half of New York State; and Allied Truck Equipment Co. of Grand Rapids, Mich., will service the western half of lower Michigan.

The firm has also appointed Jess McNeel Machinery Corp., San Antonio, Texas, to cover southwest Texas. The Cactus Equipment Co., Houston, Texas, will service southeast Texas.

H. O. Penn promotes two

F. Robert Van Riper has been promoted to general parts manager of the H. O. Penn Machinery Co., Inc., New York, N. Y. Van Riper, who succeeds A. V. La Penna, now vice president in charge of operations for the



F. Robert Van Riper, general parts manager, H. O. Penn Machinery Co.



John N. Tantillo, New York branch parts manager, H. O. Penn Machinery Co.

firm, is in charge of all parts at the firm's plants in New York City, Westbury, Poughkeepsie, and Tuxedo, N. Y.; and Newington, Conn.

Taking Mr. Van Riper's place as New York City parts manager is John N. Tantillo. He joined the firm in 1949 in the service department, and a year later was transferred to the parts department as assistant parts manager.

Two new dealers for B-E

Industrial Machinery Co., Ltd., of Halifax, Nova Scotia, Canada, has been appointed a distributor for the

DTA*

TRI-METRIC PROCESS

means longer life to...

Diamond Cutting Blades



Once again DTA* proves their leadership with "TRI-METRIC PROCESS", the new, exclusive development that guarantees you the finest quality diamond grit fused with the proper bond, grading, concentration and depth of diamond section. Test check and convince yourself that DTA Diamond Concrete Cutting Blades give you better, faster, freer cutting and longer blade life!

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6 big
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DTA* is your
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- Outstanding research and development.
- Precise control of manufacturing process.
- Highest quality diamond bond.
- The best in metal bonding.
- Top quality steel centers.
- Complete sales and field service by experienced personnel selected for their knowledge of your cutting problems.

*DIAMOND TOOL ASSOCIATES

P. O. BOX 85

HAWTHORNE, CALIFORNIA



For more facts, use Reader-Reply Card opposite page 18 and circle No. 334

GoodRoads "ODELL" SPREADER

For aggregate and asphalt spreads up to 8-inch depths



- Fits All Standard Dump or Semi-Dump Trucks
- Needs No Special Attachments
- Spreads Any Width to 10 Feet
- 2-Man Operated
- Smooth, Accurate Spread

Designed for contractors, by a contractor, the "Odell" aggregate and asphalt spreader out-performs any spreader on the market.

Hot or cold-mix asphalt, bank-run gravel, coarse slag or stone, limestone, cinders and practically any kind of base material (up to 4" in diameter) can be spread up to 8" in depth. Width of box is 8 ft., adjustable to 10 ft. spreads in 2" increments. Block-off plates supplied for narrower spreads.

Extremely accurate spread depth is controlled by the exclusive "floating" strike-off bar, mounted on runners independent of the roller and hopper. The wide steel

rollers eliminate tire marks, ruts, etc., assuring absolute smoothness of spread. Low in original cost, the Odell needs no special truck attachments. It fits all dump and semi-dump trucks . . . hooks up in a matter of seconds.

Usually operated by only two men, the use of the Odell relieves extra manpower to perform other important work. Paving contractors report savings of over 50% on average jobs since switching to the Good Roads "Odell" Spreader.

For complete details see your Good Roads distributor, or write Good Roads Machinery Corporation, Minerva, Ohio.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 335

CONTRACTORS AND ENGINEERS

Bucyrus-Erie Co., South Milwaukee, Wis. From headquarters at 163 Upper Water St., the dealer will offer sales and services on Bucyrus-Erie's line of excavators, cranes, dragline buckets, shovels, and blast hole drills for the entire province of Nova Scotia.

B-E has appointed IMC Equipment, Inc., Atlanta, Ga., the Hydrocrane distributor in Georgia. IMC Equipment has its headquarters at 720 Spring St. N. W.

Portable boring tool operates at 1/2 fpm



The Kor-It, Jr. cuts clean round cores up to 2 inches in diameter at the rate of six inches per minute.

A portable electric boring instrument that cuts holes 3/16 to 2 inches in diameter at speeds up to 6 inches per minute is available from J. F. Hamlin Co., Inc. The Kor-It, Jr. weighs 36 pounds, including its 1/2-hp motor and attachments.

The instrument will core-cut clean holes in such hard surfaces as reinforced concrete at any angle and up to depths of 8 inches—deeper with extensions. No chipping is required. The tool cuts to the exact diameter and the core is removed as a solid piece. Water is supplied through an ordinary hose from any water faucet.

For further information write to J. F. Hamlin Co., Inc., 746 Ellis St., San Francisco 9, Calif., or use the Request Card at page 18. Circle No. 80.

ARBA bulletin contains data on bridge planking

"Formed Steel Structural Plate Bridge Plank", Technical Bulletin No. 221, is available from the American Road Builders' Association. The bulletin provides information on the use of formed steel bridge flooring in Kentucky, the use of corrugated metal bridge flooring in Trumbull County, Ohio, and modern rehabilitation methods for bridges.

Other chapters detail bridge rebuilding in Minnesota, resurfacing a city street, structural plate bridge flooring, and replacing an antiquated floor system. Job photos illustrate the points of each topic.

Priced at 75 cents, the bulletin may be obtained from the American Road Builders' Association, World Center Bldg., Washington 6, D. C.

Yale & Towne to acquire Contractors Machinery Co.

The Yale & Towne Mfg. Co., Philadelphia, Pa., has entered into an agreement to acquire the net assets and business of the Contractors Machinery Co., Inc., of Batavia, N. Y., manufacturers of the Trojan line of front-end bucket loaders, graders, tamping rollers, and snow plows. The acquisition of Contractors Machinery will extend Yale & Towne's material handling line to include construction and roadbuilding equipment.

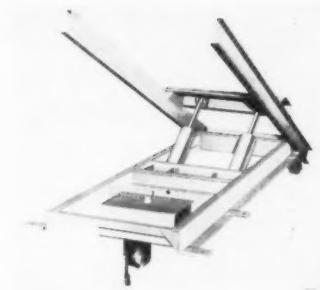
The corporation being acquired will be known as the Contractors Machinery Division of Yale & Towne. Robert G. Allan, president of the acquired company, will become general manager of the new division.

The Galion Model 443 conversion hydraulic hoist operates at a dumping angle of 45 degrees.

Conversion hoist dumps at angle of 45 degrees

A new conversion hydraulic hoist, for installation on 3/4 and 1-ton trucks, is available from the Galion Allsteel Body Co. Designed for trucks with either straight or kick-up frames and having cab-to-axle dimensions of from 46 to 60 inches, the Model 443 provides a 45-degree dumping angle. Mounting height is 8 1/2 inches.

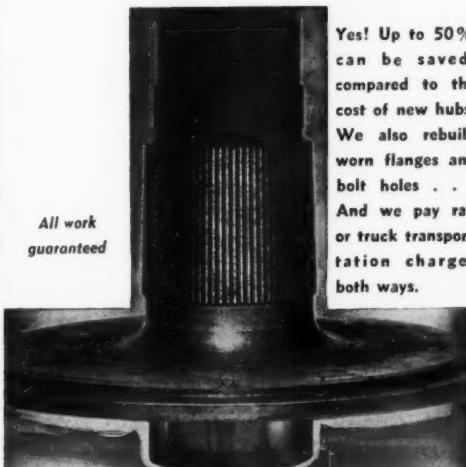
Tank, pump, manifold, and control valve are mounted as a unit. A double-shaft pump and leak-proof rotary control valve are said to provide fast



dumping action and positive hoist control. The hoist capacity rating is up to 6 tons, depending upon body length and pivot.

For further information write to the Galion Allsteel Body Co., Galion, Ohio, or use the Request Card at page 18. Circle No. 79.

You Save Up to 50% When We REBUILD YOUR "CATERPILLAR" FINAL DRIVE HUBS



Yes! Up to 50% can be saved compared to the cost of new hubs. We also rebuild worn flanges and bolt holes . . . And we pay rail or truck transportation charge both ways.

For further information, contact your nearest Caterpillar dealer, or write or wire us.

BUTLER MACHINERY CO.
Caterpillar Dealer for Eastern North Dakota
Fargo, North Dakota

For more facts, circle No. 336

Leading Contractors Demand the Genuine "Mobile Office"

GEORGE A. FULLER COMPANY BUILDING CONSTRUCTION

Ideal for—Offices • Drafting Rooms • Paymasters • Timekeepers • Engineers and many other uses conforming to the contractors' particular needs.

Mobile Offices come equipped with drafting tables, desks, lavatory, air conditioning (optional), heater, etc., and can be equipped to your specifications. Units are built for rugged use. Many of these units are being used by leading contractors throughout the U. S.

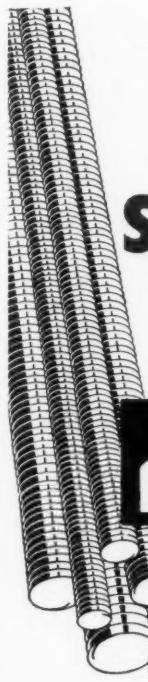
Write today and get the complete facts on how mobile units can work for you.

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PHONES DOrchester 3-1048-9

For more facts, circle No. 337

Cut Your Studs, Bolts, Hangers from

REDI-BOLT®
CONTINUOUSLY THREADED STEEL RODS
13 SIZES, 3/16" TO 1 1/2"



Construction requirements for special studs, bolts, etc., are easy to handle, if you have a supply of REDI-BOLTS on hand. Just cut REDI-BOLT to the length you need and add standard nuts. No threading necessary. These continuously threaded steel rods eliminate the need for "big" special-bolt inventories and the expense of small-quantity purchases.

All 13 diameters are supplied in standard lengths of 24" and 36"; other lengths on special order. Precision threaded in two sizes: Standard National Coarse and SAE (National Fine). Available with zinc plate or regular rust-resistant finish. Order a supply of various diameters, today.

IDEAL FOR 101 INSTALLATION, REPAIR, AND MAINTENANCE JOBS, TOO!



Made by the makers of REDI-ROD
Steel and Aluminum Bars

Ask your Mill Supply House, or write
REDI-BOLT, Inc., 5320 Indianapolis Blvd., East Chicago, Ind.

For more facts, circle No. 338

New 300-hp rear dump holds 23 yards struck

■ Two new rear-dump-type off-highway haulers, one with a rated payload capacity of 35 tons and a struck capacity of 23 cubic yards, are announced by the Euclid Division of the General Motors Corp.

A newly designed 300-hp engine with Roots blower powers the huge S-18. The rig utilizes an Allison Torqmatic drive which provides four speed ranges and a smooth flow of power matched to operating requirements, the company reports. Non-stop turns in approximately 28 feet are made possible by hydraulic power steering with a 90-degree swing. A pair of three-stage double-acting

hoists and a dumping angle of 60 degrees, assure fast operations, the firm claims.

The Model S-7 rear dump has a struck capacity of 8 cubic yards and a rated payload of 12 tons. It is powered by a 143-hp engine through a five-speed transmission. The S-7 has a top speed of 25 mph and can negotiate a 26 per cent grade with a full load. Hydraulic power steering with a 90-degree swing makes possible non-stop turns in less space than the machine's length. Dumping is at a 66-degree angle by means of a three-stage double-acting hoist.

The semi-trailer bodies of the S-18



The new Model S-18 rear dump has a rated payload of 35 tons and a struck capacity of 23 cubic yards. It is powered by 300-hp engine with Roots blower and Torqmatic drive.

*Write for this FREE
New 12-page Data Book
It tells HOW TO SAVE Time and Money*



Every maintenance engineer in industry and construction should have this complete compilation of data on the application and use of Punch-Lok Hose Clamps . . . the perfect clamp for . . .

Pneumatic Tool Hose Suction and Discharge Hose
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RUGGED!

ARCTIC BOY portable water coolers



WITH THE NEW SPARKLEEN® liner

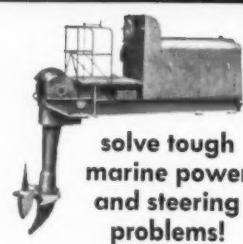
... keeps water
sparkling
clear

THE SCHLUETER MFG. CO.
ST. LOUIS 7, MO.



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HARBORMASTERS



solve tough
marine power
and steering
problems!

Harbormasters are complete, heavy duty marine power packages, quickly and easily installed for immediate use. They are efficient, economical to operate and maintain . . . and they give you many special features not found with ordinary marine power. They are ideal for shallow or deep water, for coastwise service, as well as in harbors, lakes, canals, and rivers.

In hundreds of installations Harbormasters are moving bigger payloads at less cost, in less time. Send for catalog and get complete details.



Steer in any direction with full power



Rugged, powerful,
easily installed



Shallow water protection



Economical operation
and maintenance

MURRAY & TREGURTHA, INC.

44 Hancock Street, Quincy 71, Massachusetts

For more facts, circle No. 341

and the S-7 rear dumps are interchangeable with the bowls of the S-18 and S-7 Euclid scrapers. The S-7 is available with a low-height body having a 5-cubic-yard capacity, for jobs on which height restrictions exist.

For further information write to the Euclid Division, General Motors Corp., 1361 Chardon Rd., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 71.

Text discusses natural stone, clay products

"Modern Masonry, Natural Stone and Clay Products" contains the edited papers and discussions of a research correlation conference conducted by the Building Research Institute. The book is divided into five parts. Part 1 details architectural design—colors and textures in masonry, aesthetic demands of contemporary architecture upon masonry, and modular design with masonry. The technology of building with masonry—reinforced masonry walls, cavity, veneer, and face-bonded walls—is developed in Part 2.

Parts 3, 4, and 5 discuss research and new technical developments, costs and maintenance, and building type analysis. Pictures, diagrams, and charts supplement the written material.

Priced at \$4.50, the book may be purchased from the Building Research Institute, Division of Engineering and Industrial Research, National Academy of Sciences-National Research Council, 2101 Constitution Ave., Washington 25, D. C.

Equipment cleaner

■ A folder containing reports from users on how they profit from cleaning construction machinery with Malsbary HPC (high-pressure combination) cleaners is available from the Malsbary Mfg. Co. Malsbary HPC cleaners combine pumped hydraulic and thermal pressures, and deliver a 300 to 400-pound cleaning blast at temperatures 100 degrees hotter than any other steam cleaner, according to the manufacturer.

To obtain Form No. C-921 write to the Malsbary Mfg. Co., 845-92nd Ave., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 8.

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Convention Calendar

April 8-10 American Society of Mechanical Engineers

Spring Meeting, Dinkler Tutwiler Hotel, Birmingham, Ala. L. S. Denegar, director of public relations, ASME, 29 W. 39th St., New York 18, N. Y.

April 15-17 Building Research Institute

Sixth Annual Meeting, Drake Hotel, Chicago, Ill. William H. Scheick, executive director, BRI, 2101 Constitution Ave., Washington 25, D. C.

April 22-25 Purdue Road Show and Road School

Forty-third Annual Road Show, Memorial Union Bldg., Purdue University, Lafayette, Ind. Ben H. Petty, PRS-RS, Civil Engineering Bldg., Purdue University, Lafayette, Ind.

April 27-May 4 International Commission on Irrigation and Drainage

Third Congress, Sheraton-Palace Hotel, San Francisco, Calif. Walter E. Blomgren, committee chairman, ICID, P. O. Box 7826, Denver 15, Colo.

April 29-May 1 American Wood Preservers Association

Meeting, Conrad Hilton Hotel, Chicago, Ill. Wm. A. Penrose, secretary-treasurer, AWPA, 839 17th St. N. W., Washington 6, D. C.

April 29-May 3 National Materials Handling Exposition

Exposition, Convention Hall, Philadelphia, Pa. Clapp & Poliak, Inc., NMHE, 341 Madison Ave., New York 17, N. Y.

May 3 Conference for Engineers and Architects

Fourth Annual Conference, Ohio State University, Columbus, Ohio. Gordon B. Carson, engineering dean, Ohio State University, Columbus, Ohio.

May 13-15 Construction Surveyors Institute

Thirty-first Annual Conference, Hotel Washington, Washington, D. C. G. Szmark, executive secretary, CSI, 101 Park Ave., New York 17, N. Y.

May 15-17 Jet Age Conference

Conference, sponsored by American Society of Civil Engineers and the Port of New York Authority, Park Sheraton Hotel, New York, N. Y. John M. Kyle, general chairman, JAC, 33 W. 39th St., New York 18, N. Y.

May 16-17 Highway Engineering Conference

Conference, Student Service Center, University of Florida, Gainesville, Fla. Emil R. Hargett, assistant professor, HEC, Department of Civil Engineering, University of Florida, Gainesville, Fla.

May 16-18 New York State Society of Professional Engineers

Convention and Engineering Industries Exposition, Statler Hotel, New York, N. Y. John Lanigan, chairman, NYSSPE, 1941 Grand Central Terminal Bldg., New York 17, N. Y.

May 20-23 American Society of Mechanical Engineers

Second Annual Design Conference in conjunction with Design Engineering Show, New York Coliseum, New York, N. Y. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

May 27-28 American Institute of Steel Construction

National Engineering Conference, Edgewater Beach Hotel, Chicago, Ill. L. Abbott Post, executive vice president, AISC, 101 Park Ave., New York 17, N. Y.

June 4-7 American Society of Civil Engineers

Meeting, Statler Hotel, Buffalo, N. Y. D. P. Reynolds, assistant to secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

June 11-14 Western Association of State Highway Officials

Meeting, Shamrock-Hilton Hotel, Houston, Texas. D. C. Greer, president, WASHO, State Highway Engineer, Texas State Highway Department, Austin 14, Texas.

June 17-21 American Society for Testing Materials

Annual Meeting, Chalfonte-Haddon

Hall, Atlantic City, N. J. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

June 24-29 Concrete Reinforcing Steel Institute

Meeting, The Greenbrier, White Sulphur Springs, W. Va. H. C. Delzell, managing director, CRSI, 38 S. Dearborn St., Chicago 3, Ill.

June 24-25 Wire Reinforcement Institute

Annual Spring Meeting, The Greenbrier, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington 4, D. C.

Goodyear traffic manager

Francis A. Hartney is now traffic manager of the Los Angeles plant of The Goodyear Tire & Rubber Co., Akron, Ohio. He replaced L. W. Young, who has retired.

depend on dependable **McGOWAN PUMPS**

LIGHT and HEAVY DUTY

... backed by more than a century of engineering and in-the-field experience

McGowen Pumps designed and shop tested to meet A.G.C. standards

DISTRIBUTORS NOTE!

A Number of Attractive Territories Still Available

If your territory is open, here is an opportunity to increase your earnings with this respected, well-known brand. Easy to sell . . . highly profitable . . . COMPLETE LINE of Self-Priming Centrifugal and Diaphragm Pumps.

WRITE TODAY FOR FULL DETAILS.

McGOWAN PUMPS Dependable Pumps Since 1852

DIVISION OF LEYMAN MANUFACTURING CORP., 58 Central Ave., Cincinnati 2, Ohio

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Crowds Can't Crumble N. Y. Coliseum's Concrete Floors Protected by LAPIDOLITH

More than 2,500,000 people have scuffed their way over these floors. Millions more will do so. But management won't be worrying about dusting or crumbling. These concrete surfaces are hard and tough as flint.

Let LAPIDOLITH protect your concrete floors . . . and your investment, too, with a fully-guaranteed job backed by one of the largest bonding companies, when LAPIDOLITH is applied under our FREE supervision or under contract.

LAPIDOLITH—a colorless, easy-to-use chemical solution—penetrates into the porous concrete. It can make your present concrete floors harder.

HOW MUCH HARDER? Radioactive tracer tests prove that the deeper penetrating action of LAPIDOLITH extends deeply below the surface. That's why we can truthfully say that LAPIDOLITH penetrates and hardens in depth—that floors treated with LAPIDOLITH are up to 10 times harder. They will resist chemicals, grease and oil. To date, LAPIDOLITH has hardened over 500 million square feet of industrial floors.

ACT NOW. Replacing worn-out concrete floors costs many, many times more than an application of LAPIDOLITH. Mail the coupon today for full information.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 343



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Building Products Division—Dept. CE-4
404 Fourth Avenue, New York 16, N. Y.

- Send complete information on Lapidolith and Bonded Guarantee.
- We would like a FREE floor inspection and recommendation. (Minimum floor area, 5,000 square feet.)
- Send FREE 128-page Building Construction and Maintenance Handbook.

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THE LINE THAT
IS COMPLETE



LIGHTWEIGHTS

1½" - 2" - 3"

- 5500 to 18,000 GPH
- Iron or Aluminum
- Powered with 4 Cycle Air-Cooled Gasoline Engines

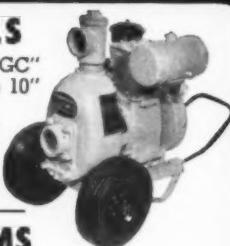
PUMP DISTRIBUTION —

Check on the availability of the RICE LINE for your territory.

CENTRIFUGALS

All Standard "AGC"
Sizes from 1½" to 10"

- Air and Water Cooled Power
- Modern Design
- Precision Built



DIAPHRAGMS

2" - 3" - 4" Singles
Big 4" Double

- Single or Double
- Lightweight
- 48:1 reduction
- Gearing fully enclosed and operates in oil.



The Model B Testborer, shown a drilling core, can also auger and drive spoon samples and casing or pipe.

RICE PUMP & MACHINE COMPANY

228 PARK AVENUE

BELGIUM, WISCONSIN

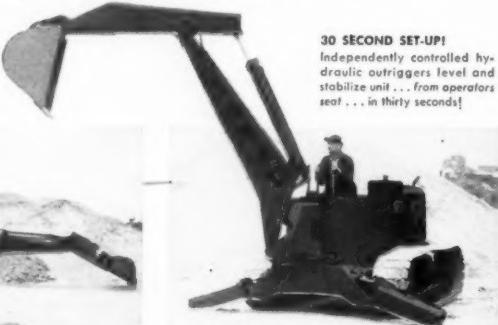
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HEAVIEST-DUTY, LARGEST GPM HYDRAULIC SYSTEMS AVAILABLE EASILY OPERATED...FAST CYCLING...



Gives you MORE
WITH BACKHOE
OR SHOVEL BUCKET

Put a man on a HOPTO and he's twice the money-maker! HOPTO's effortless 20-second cycles... HOPTO's new, more powerful triple tandem pump and split hydraulic system... and HOPTO's fast switch from backhoe to shovel give you more for your money... more for your time! Get the facts on HOPTO—new and better than ever!



30 SECOND SET-UP!
Independently controlled hydraulic outriggers level and stabilize unit... from operator's seat... in thirty seconds!



HOPTO 360-57-90 takes a half-yard bite, is the only unit with a 360° continuous swing, and cycles fast with backhoe or shovel bucket. Mounts on truck or carrier.

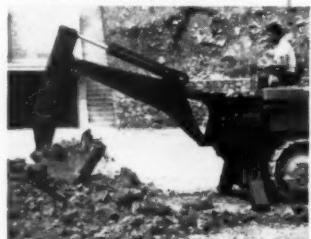


HOPTO 185 SPR gives you an integral built digger-shovel-crane on rubber. Handles up to 30" bucket. Rolls to job-site at highway speeds.



HOPTO 190 SPC, the complete unit model that packs real work-capacity on tracks in a mobile, compact unit that gets in anywhere... even on marshy soils.

HOPTO 80 CTM mounts on a crawler tractor, handles up to 30" bucket, cuts costs by using power you now have.



SPECIFICATIONS						
MODEL	SWING REACH	DIGGING DEPTH	CLEARANCE BACK-SHOVEL	LOADING HOE BUCKET		
360-57-90	360°	30"	20'-0"	15'-6"	16'-10"	
200 DTM-57-72	200°	19"	13'-6"	11'-6"	9'-3"	
190 SPC	190°	17'-2"	11'-3"	9'-3"	9'-7"	
185 SPR	185°	17'-2"	11'-3"	9'-3"	9'-7"	
80 CTM	180°	14'-6"	10'-0"	7'-1"	7'-5"	

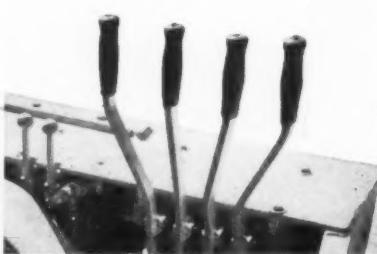
180° BUCKET TILT ON ALL MODELS

One of the twelve HOPTO models is tailor-made for you. Write stating your needs and complete information on the unit to fit your requirements will be promptly forwarded.

BADGER MACHINE COMPANY
WINONA, MINNESOTA DEPT. E

NEW SIMPLE CONTROLS

An hour's practice and a handyman can safely handle a HOPTO! Four handy levers control boom and bucket; two separate levers give individual control of each outrigger for fast leveling and stabilizing from operator's seat... in half a minute!



For more facts, use Reader-Reply Card opposite page 18 and circle No. 346



Self-pro covers

■ A new
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Arc welding information

■ An electrode data book has been prepared by the National Gas Cylinder Co. Included are sections on AWS-ASTM arc-welding electrode specifications, estimation of electrode consumption, and factors in selecting electrodes.

To obtain Form No. NH-504 write to the National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18 Circle No. 96.



The Tampo Model SP-11S compactor will cover an 88-inch-wide surface at speeds up to 22 mph.

Self-propelled compactor covers wide area quickly

A new self-propelled pneumatic compactor that will cover an 88-inch-wide surface at speeds up to 22 mph is announced by the Tampo Mfg. Co. The SP-11S is an 11-wheeled machine with a gross ballasted weight of 22,600 pounds.

Other features of the machine include power-operated reversing clutches combined with a torque converter for forward-reverse operation; single-lever control for both direction and throttle; and a throttle-controlled mechanical governor.

The SP-11S is available with a 65-hp gasoline or diesel engine. Accessories for rolling asphalt, soil cement, and other surfaces are available.

For further information write to the Tampo Mfg. Co., 1146 W. Laurel, San Antonio, Texas, or use the Request Card at page 18. Circle No. 93.

Two-year course on civil and highway engineering

Starting in September, a two-year training program for students of civil and highway engineering will be inaugurated at Wentworth Institute, Boston, Mass. The course will train the students as engineering technicians, and after graduation the students will be qualified for positions with engineering firms, public utilities, and municipal, state, and federal engineering departments.

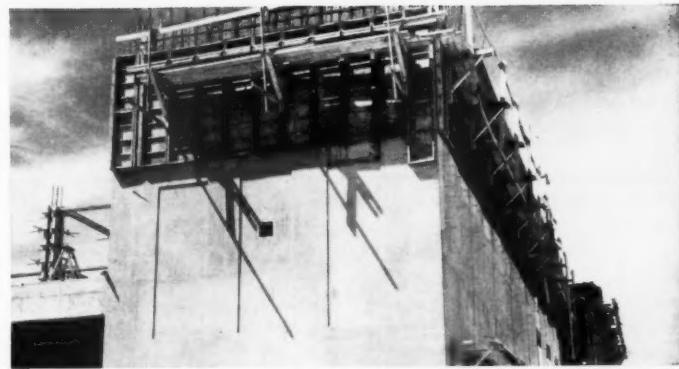
The training program will balance theory with practical application. One day a week will be devoted to practical field work in surveying, culvert and abutment construction, and highway building in a roadbuilding laboratory.

To be admitted to the school, it is required that the applicant have a high school diploma, and have completed algebra 1 and 2, plane geometry, English, and physics. Chemistry or biology may be substituted for physics.

Export firm moves office

William H. Schuelie & Co., New York, N. Y., have moved to Suite 16-L 440 E. 79th Street. Schuelie handles Littleford Bros., Inc. Kwik-Steam generators in the New York and New Jersey areas, and is the special export representative of Littleford in New York and Washington.

William H. Schuelie, Jr., has been appointed salesman of bituminous equipment.



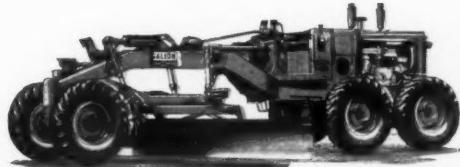
Walls, Slabs, Beams and Stairways Formed with Symons Forms

8,500 square feet of Symons Forms with steel cross members, 200 column clamps and 520 shores were used by Sullivan Long and Hagerty, Birmingham, Alabama, for construction of the new \$6,000,000 Jefferson County (Birmingham), Alabama, sewage treatment plant, vacuum filtration and flash drying building, and six digester tanks.

Forms were leap-frogged for successive lifts on the walls. Slab thickness ranged from five to seven inches and Symons 8-foot shores with 8-foot extensions on four foot centers were used to hold the slabs 23 feet high.

Symons Forms may be rented with purchase option. For more information on Forms, Clamps and Shores write for literature. Symons Clamp & Manufacturing Company, 4251 Diversey Avenue, Dept. D-7, Chicago 39, Illinois.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 347

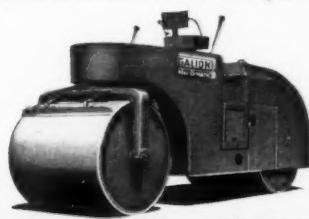


GRADE-O-MATIC

GRADE-O-MATIC Drive utilizes a torque converter with tail shaft governor and power-shift transmission, in combination with correct balance of grader weight and power to produce most "push-power" at the blade. No foot clutch or gear shift lever. Automatic features simplify operation and provide top-most performance.

GRADE-O-MATIC GRADERS

Model T-700	190 h.p., 40,125 lbs.
Model T-600	140 h.p., 30,420 lbs.
Model T-500	125 h.p., 25,765 lbs.



ROLL-O-MATIC

ROLL-O-MATIC Drive utilizes a torque converter in which the engine driving force is automatically MULTIPLIED and applied in an infinite number of driving ratios as the work demands. No master clutch, no engine throttle - no gear shifting. Shock loads and engine stalling are eliminated. Life of roller is increased.

ROLL-O-MATIC ROLLERS

TANDEM MODELS - Variable Weight

Two-Axle 5-8, 8-10½, 8-12, 10-14 ton sizes.

Three-Axle 14-20 ton size.

THREE-WHEEL MODELS

"Chief" 4 sizes, 10 to 16 ton.

"Warrior" 2 sizes, 7 to 10 ton.

Both "Chief" and "Warrior" Three-Wheel Rollers are available with ballastable or non-ballastable rolls.

Write for complete information

THESE NAMEPLATES are your assurance of UNSURPASSED PERFORMANCE

GALION,
OHIO,
U. S. A.

GALION



THE GALION IRON WORKS & MFG. COMPANY

General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 348

Banks to aid roadbuilding, despite "tight money" situation

The concept of the new highway program conforms to basic political philosophy: having the federal and state and local governments work side by side provides a team operation—guidance being provided by the federal government, and vitality, initiative, and resourcefulness by local communities or states. This facilitates planning, and avoids the dictatorship that might occur under a government not rooted in traditions of combined federal and local authority.

In banking, this concept is called the dual system. Over the last century, the dual concept of the banking system has been invaded to the extent that the national interest has increasingly required a closer supervision over money and credit. Banking is at the nerve center of the economy. It provides the money for the country. While there is still a dual system of banking—that is a network of some 14,000 local, national, and state banks—a monetary authority, the Federal Reserve System, has been superimposed on them. The function of this system is to influence the cost and to regulate the supply of money and credit flowing through the banking system and on out through all avenues of economic activity.

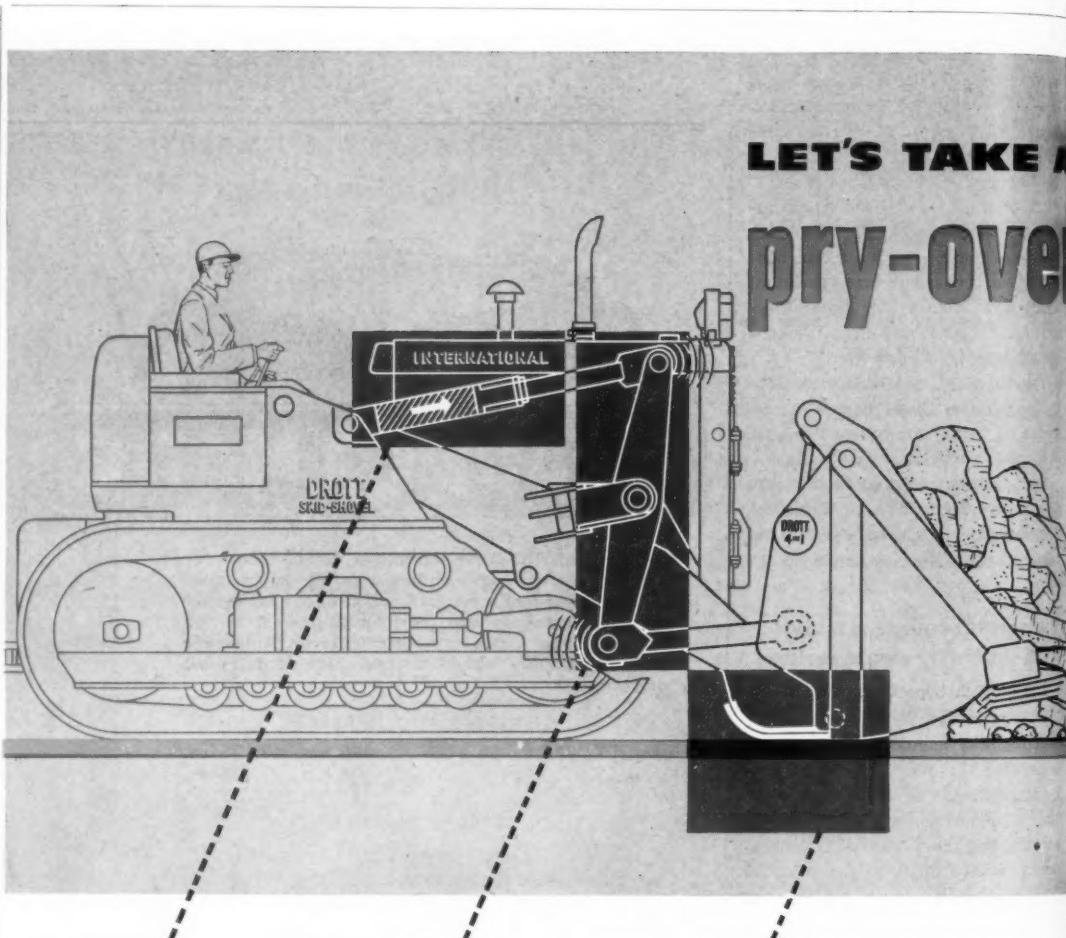
It is this regulation of the supply of money and credit that has, in recent months, given rise to the so-called "tight money" situation that is so much in the minds of local governmental officials and others concerned with the highway program. In the past, failure to provide adequate regulation of the supply of money and credit led to damaging economic instability; it is just such damage that the Federal Reserve System is trying to avoid at the present time.

Credit supply

A short time ago, Chairman Martin of the Federal Reserve Board stated at a hearing before the Congressional Joint Economic Committee that the task of the Federal Reserve System is to "determine the volume of credit that needs to be made available in order to keep the economy running in high gear, but without overstrain." After pointing out that "too much credit would intensify upward pressures on prices, and that too little could needlessly starve some activities", he stated "that experience had demonstrated that allocations of credit, determined through the market processes, are to be preferred to the judgments or guesses of public authorities, however well intentioned." Established Federal Reserve policy seeks two objectives: economic stability and economic growth.

by FRED F. FLORENCE

Chairman of the executive committee
and chief executive officer,
Republic National Bank of Dallas,
Texas



Full hydraulic power transfer!

Famous International Drott triple-power hydraulic force results from ingeniously applying oil pressure upon the piston's *full face*—instead of using the customary, and limited, rod-end area for the "power-push" surface! Only International Drott gives you this tremendous hydraulic power to produce concrete-smashing, tree-grubbing, boulder-bucking pry-action break-out!

Far greater leverage.

See how International Drott scientifically-correct *lever length* transfers *full* triple-power hydraulic force to the fulcrum. No costly power-dissipating "step-downs" here to lose one-fourth to one-half your hydraulic power, as ordinary design does! Instead, International Drott full power-applying leverage gives you tough-job-handling digging force and capacity ordinary loaders can't even begin to equal!

Ground-based fixed fulcrum!

Here's how exclusive International Drott design provides the famous frame-mounted skid-shoes—to act as the absolutely necessary *fixed fulcrum*. Without this, true pry-action break-out is impossible. The big *exclusive* International Drott skid-shoes provide the steady, ground-based platform for true ground-level bucket-heaping roll-back of 41°!

Prove to yourself you command a vast new job-range and capacity—with this super-powerful excavating, bucket-heaping pry-action. See what happens when you team this performance with the *versatility unlimited* of an exclusive Four-In-One. Compare how *exclusive* shock-swallowing Hydro-Spring "gentles" trouble-causing impact by 67%! Ask your International Drott distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL®
DROTT®

**Sound projects and firms will be able to compete
for credit; regulation of money aimed at avoiding
inflation in costs, prices**

The pursuit of these objectives, under the philosophy of credit regulation, is in the democratic tradition. It is not federal dictation from above as to who should be granted credit, and who should be denied credit. That philosophy provides a monetary policy which would avoid further inflation while disrupting the normal processes of our free economy as little as possible. The grantors of credit—banks and other lenders—have broad freedom to allocate the available supply of credit as they deem appropriate.

The market place determines who is to receive credit, and how much.

Credit restraint

During the past year or more, a great deal has been said about "tight money" and its possible effect on the highway program. This is the current situation: as long as inflationary forces continue to press heavily upon our economy, the Federal Reserve authorities have deemed it essential to restrain an excessive expansion of credit, which would add purchasing power to the economy and increase competition for labor and materials that are already scarce in key sectors. The banking system is the medium through which this credit restraint is exercised, and the Federal Reserve System, through the market mechanism, has held down the creation of new bank reserves which make possible the expansion of bank credit or our supply of money.

But it should be remembered that other financial institutions, such as insurance companies, trust funds, savings and loan associations, pension funds, and even the federal government, are capable of supplying credit.

The relationship between the supply and demand in any market is expressed in prices. In credit markets, the price which eventually balances supply with demand is the interest rate. The situation recently has been one in which demand for capital and credit has been unprecedented. Since the resources of our financial institutions have been taxed to an extent never before experienced, interest rates have risen sharply.

In building more industrial plants and other productive facilities, homes, shopping centers, commercial buildings, schools, public areas, and highways, we are seeking to maintain and extend our standards of consumption. We are attempting to enlarge our supplies of essential materials and smooth the flow of them through productive channels.

All of these prospective demands combine to produce a tremendous pressure, directly and indirectly, on the available supply of money and credit. There are just not enough accumulated savings that can be apportioned among users of credit to accomplish all we are trying to do. The alternative would be to create a greater supply of credit in the form of money. But this inflationary course must be avoided if we are to have stability and continued growth in the long run.

"Tight money" performs function

Part of the answer to credit inflation and instability is credit restraint. Yet "tight money"—or credit restraint—is not an end in itself. It merely reflects a situation in which there is a heavy demand for credit and a supply of credit that is permitted to expand only as rapidly as can be justified by the constructive use of available production facilities. "Tight money" does not mean that credit is unavailable. It does mean that those

—For more facts, circle No. 349

Take a CLOSE LOOK AT TRUE shoe break-out action

**Only original and exclusive International Drott design
transfers full hydraulic power to give you tremendous
extra excavating force!**

Genuine pry-action break-out has three absolute essentials: (1) *full hydraulic power transfer*; (2) *long lever*, to apply pry-power without power loss; (3) *fixed fulcrum*, located to concentrate break-out force for maximum effect.

Here's how exclusive International Drott "separates the men from the boys" in heavy-duty loader design—and gives you front-end loader performance and capacity nowhere else available.

Kuschler Construction Co., New Orleans, Louisiana, specializes in demolishing old service stations to be replaced with super-service stations.

Kuschler tore down this old station in one day, then removed the concrete work the second day—doing the entire job with their International Drott TD-9 Four-In-One!

Previously, the contractor demolished the buildings and

concrete with compressed air hammers and a three-man crew. Their other make of front-end loader, without true pry-action break-out, was limited to loading debris.

Now, one man, using triple-power International Drott pry-action break-out, accomplishes as much in one day as the three-man crew and four separate items of equipment were able to do in a whole week!



(Continued from preceding page)

who seek it must be willing to compete for it in the markets, and it does mean that lenders must exercise a greater degree of selectivity in allocating available funds. In times like these, borrowers, as well as lenders, must consider whether or not the purposes for which credit is to be used are essential, not only because of the effect upon their own affairs, but also because of its effect upon the general welfare of the entire country.

According to the resolutions of the annual convention of The American Bankers Association, "Banks have the important responsibility of seeing that credit is used for constructive purposes that help to preserve stability and make for further growth on a

sound basis. Within the framework of current Federal Reserve Policy, banks must help to balance the forces of demand for credit against a supply which can accommodate the sound requirements of an economy that sometimes tries to do too much in too short a period."

Stability aids roadbuilding

It is my firm conviction—and this reflects the basic philosophy of the banking industry as expressed in the resolution—that one of the soundest things bankers can do as the highway program gets under way is to assist in the preservation of the nation's over-all economic stability as a sound base for growth.

For a long time, credit was abnormally cheap because demands never

quite matched a supply that was permitted to grow rapidly, but at a price and in a manner that contributed to inflation. It used to be relatively simple to obtain funds for a project, once authorization was obtained from legislative authorities.

But today, demands for highway funds, like all other demands for credit—even those of the federal government—must meet a more rigid test of the market. This seems at times to impose a hardship on those who once were accustomed to obtaining credit easily.

Monetary authorities and the banking fraternity are as fully conscious of the need for great new highways as any other groups in the country. But they are also aware of the need for schools and other types of construction. They also understand that our ability to progress depends on our productivity, and that programs for capital expansion and technological improvement hold the greatest promise for such progress. They know the need for national defense and its heavy drain on the budget. In short, they must weigh all these and many other claims against economic resources—whether made through channels of credit or taxation—when considering a demand for credit.

They must remember that the danger of inflation is real, and that it is a problem for all of us. This was forcibly presented by President Eisenhower who, in his State of the Union message, said that "the danger is always present, particularly if the government might become profligate in its expenditures or private groups might ignore all the possible results on our economy of unwise struggles for immediate gain. This danger," the president added, "requires a firm resolution that the federal government shall utilize only a prudent share of the nation's resources, that it shall live within its means, carefully meas-

uring against need, alternative proposals for expenditures."

Natural priority

Right now, it is comforting to know that we are still relying on the dynamic forces of competitive markets to allocate our nation's resources—that is, to decide which of our goals are to take priority. This means that we do not have to decide arbitrarily whether it is more essential to provide structural steel for a highway bridge, for schools, for new facilities to increase steel-making capacity, or for new equipment to produce other road-building materials.

Beyond helping to preserve economic stability, there are some tangible contributions that bankers can make toward the highway program

This is a \$ into account and local demands

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RAILROAD BRIDGE DECK BUILT WITH HOLLOW CONCRETE SLABS!



Western Pacific RR bridge. Bridge engineers of the Western Pacific RR, designers. Ben C. Gerwick, Inc., San Francisco, general contractor.

Close-up of voided slabs showing hollows formed by 16" O.D. SONOVOIDS.

Sonoco's low-cost SONOVOID® FIBRE TUBES form voids in precast slabs!

The Western Pacific bridge near Yuba City, Cal. is the longest all-concrete railroad bridge in the U.S.

Pairs of 55-ton hollow precast concrete slabs make up the bridge deck for both approaches. Each of these slabs is voided with two 16" O.D. SONOVOIDS.

The SONOVOID-formed hollow cores also serve as conduits for signal communication wires and power lines.

SONOVOID Fibre Tubes save concrete and reinforcing steel without impairing structural strength.

Easy to handle, low-cost Sonoco SONOVOIDS are specifically developed for use in bridge decks, wall, floor, roof and lift slabs; also in concrete piles. For precast units or units cast in place. Available in sizes from 2.25" O.D. to 36.9" O.D. up to 48' long. Order in specific lengths or saw to your requirements on the job. End closures available.

See our catalog in Sweets.

for technical information and prices, write



SONOCO PRODUCTS COMPANY

CONSTRUCTION PRODUCTS DIVISION

HARTSVILLE, S.C.

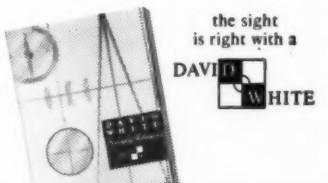
LOS ANGELES, CAL.
5955 SOUTH WESTERN AVE.
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 350

Just out!

NEW David White CATALOG

First really new catalog in the instrument field. Contains complete, up-to-the-minute facts about the entire David White line of precision instruments... as well as news about some brand new David White products. Fill out the coupon—and mail today.



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DAVID WHITE

David White Instrument Company
2501 N. 19th Street
Milwaukee 5, Wisconsin

Please send the 1957 David White Instrument Catalog to:

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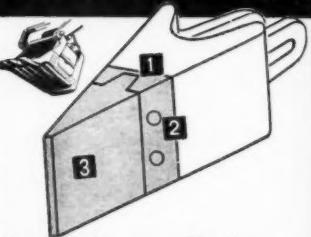
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NEW! Bulldog Replaceable Digger Teeth

CUT INVENTORY AND REPLACEMENT TOOTH COSTS UP TO 65%



Revolutionary Design

Has Just 3 Parts

1. Universal Weld-On Adapter uses old tooth as a base. Saves the cost of conventional adapter or new tooth. Same adapter fits on several different types of equipment. Easily welded on worn teeth.



2. Positive Lock Pins that give a tight fit to the replaceable tooth and are easily removed for replacement.



3. Easy Change Replaceable Tooth*, changed with a hammer and punch. Has reversible bevel point. Made of highest quality alloy steel—heat treated to outwear all other teeth. Field tested in taconite mines under toughest abrasive conditions. Bulldog Teeth have consistently shown cost savings up to 65%.



YOU NEED ONLY A FEW ADAPTER SIZES TO FIT ALL POPULAR MAKES OF

Shovel Dippers Dragline Buckets
Back Hoe Buckets Clamshell Buckets
Loader Buckets

For descriptive folder, technical data, prices, and name of your nearest dealer—

*pat. pending Write Dept. CN-1
Sales Representative and Distributor
Inquiries Invited



For more facts, circle No. 352
CONTRACTORS AND ENGINEERS

This is a \$100 billion program, taking into account the federal, secondary and local network of roads, and it demands credit.

It is well to reflect upon what \$100 billion might have bought in highways only ten or twenty years ago. Rising costs raise havoc with long-range planning. In periods when inflationary pressures are strong, the best-conceived financial program may run out of money and new sights have to be set. This, again, emphasizes the importance of preserving economic stability and the value of our money.

Change in view

It is significant that, in the prevailing atmosphere of optimism and exuberance, the approach toward public works planning has been modified. Not very long ago, the building of public roads and other civic improvements was looked upon by many as a natural instrument for economic planning—a vehicle that could be used as an economic stabilizer. Public works, it was felt, could make up the deficiency in private spending and generate a flow of income that would tide us over setbacks in the non-government sector of the economy.

The weakness of this theory is clearly demonstrated in today's approach to construction of such things as highways, schools, and homes. In a growing economy, we cannot always wait to do things that are part of the process of growing.

Despite current monetary restraint, the resources of our banking system are being used to an extent never before experienced. Our loans are at an all-time high, and their increase over the past two years to all types of business has been the largest on record. The credit wheels are still spinning, but banks have to be more selective in their lending and investing operations simply because there are just not enough funds for everything.



OMAHA STANDARD
2401 W. Broadway, Co. Bluffs, Ia.
For more facts, circle No. 353

APRIL, 1957

In these times, a discriminating lending policy can help channel funds to sound enterprises, and this will, in turn, counteract inflationary pressures.

Banking institutions are prepared, under prudent standards of safety, to grant worthy borrowers—including those in the roadbuilding industry—the credit they need. Sound bank credit will be made available for the development and production of raw materials, for the distribution of materials, for the creation of new industrial facilities and equipment, for the production of roadbuilding equipment, for contractors, for governmental agencies, and, finally, for the vehi-

cles that will speed along the highways of tomorrow.

THE END

From an address by Fred F. Florence before the annual convention of the American Road Builders' Association in Chicago, Ill.

Hollow auger permits sampling while boring

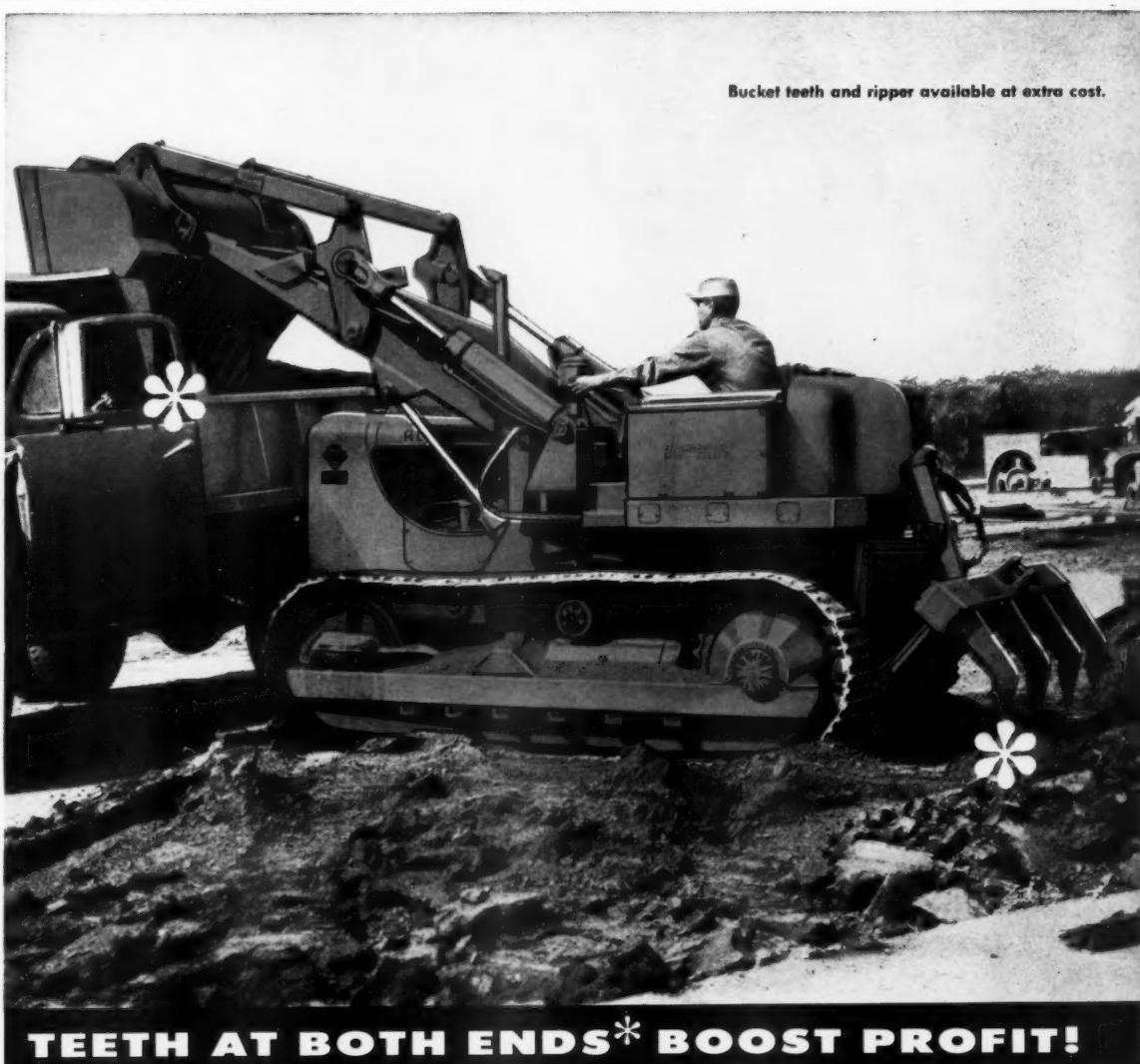
■ A hollow-stemmed auger that permits undisturbed sampling without withdrawing the auger from the drilled hole is announced by Mobile Drilling, Inc. The MDX 9026 auger is available in diameters of from 7 to 10 inches OD and 2½ to 6 inches ID, in lengths of from 2 to 10 feet.

The new auger acts as its own cas-

ing. A removable plug in the drill head of the lead auger prevents material from entering the hollow core. When the desired depth is reached, the plug is removed and the sampling tool is lowered through the hollow augers to the strata to be tested.

Coring may be continued through the hollow stem of the MDX 9026 after rock has been reached. The center plug is removed and a diamond bit core barrel is placed into the auger and lowered to the rock.

For further information write to Mobile Drilling, Inc., Dept. 18, 960 N. Pennsylvania St., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 89.



TEETH AT BOTH ENDS* BOOST PROFIT!

Production really steps up when this working team moves in—the Allis-Chalmers HD-6G tractor shovel with replaceable bucket teeth and rear-mounted ripper. Here's a job-proved combination engineered by the company that pioneered modern tractor shovels for the construction industry.

When the hydraulically controlled ripper bites in, even hard blacktop has to give. With the help of teeth at the front end, too, tough material is loosened and broken up for fast, easy loading—a full bucket every time.

You get more work done in less time because the heavy-duty HD-6G is designed for tough jobs. With 72 net engine hp and six-truck-wheel stability, it offers performance that means efficient production, bigger profits for every hour on the job.

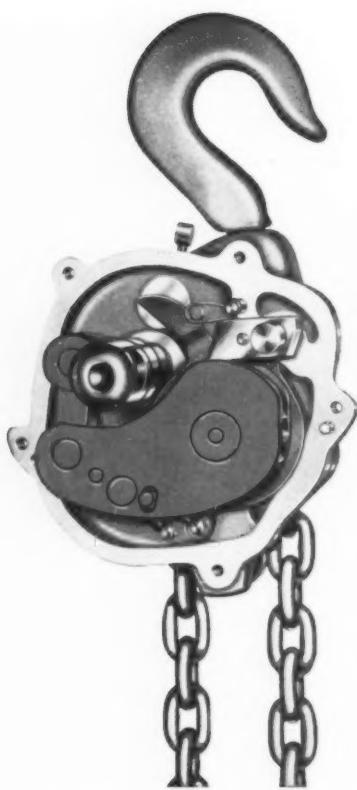
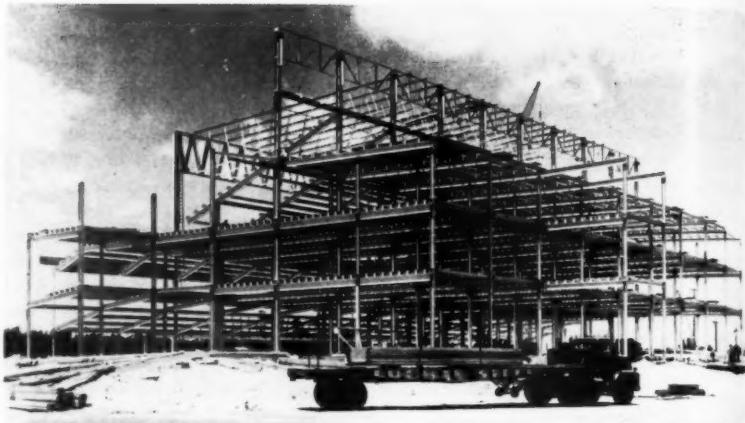
These important advantages are also available on bigger Allis-Chalmers tractor shovels—the 2½-yd HD-11G, the 3-yd HD-16G, and the 4-yd HD-21G . . . to help you meet the needs of your tractor shovel jobs profitably. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

For more facts, use Reader-Reply Card opposite page 18 and circle No. 354

STILL IN FACTORY WRAPPINGS, Douglas fir arches frame the roof of the gym-auditorium for a high school of wood construction in Nantucket, Mass. All framing has maximum structural strength through the use of ring connectors and framing anchors, which were developed as improved wood fastenings by the research affiliate of the National Lumber Manufacturers Association.



New Compound Levers

Make Coffing Super Powers the most efficient hoists in their class

Super Power hoists are designed around a new compound leverage principle. The levers, which replace the gears of conventional designs, enable workmen to raise loads with less handle pull than other hoists of the same capacities. Since use of the levers also reduces hoist size and weight, the workmen have 20% less weight to carry to the job.

Available in 1½ and 3 ton capacities in aluminum, and 1½ to 5 tons in malleable iron, Super Powers require little maintenance, since moving parts have sealed-in lubrication. Overload testing, "Safety Valve" handles, and constant load-locking ratchet and pawl assure safe operation. For complete details on these hoists, consult your Coffing distributor, or write to us for Bulletin L-3.



Coffing Hoist

DIVISION OF DUFF-NORTON COMPANY
810 WALTER STREET DANVILLE, ILLINOIS

Rachet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists, Rachet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks

For more facts, use Reader-Reply Card opposite page 18 and circle No. 355

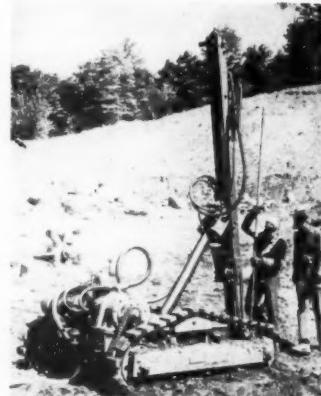
Mobile wagon drill operated by one man

A new self-propelled wagon drill for the production drilling of blast holes is announced by the Worthington Corp. The Blue Brute Port-A-Trac is self-locking in stop position, will not creep, and needs no brake or lock mechanism.

Easily operated by one man for quick hole spotting, the Port-A-Trac is designed with standard parts that are field replaceable, the company reports. The drill accommodates up to a 10-foot chain feed and drifter assembly.

Special features include a hydraulically operated boom for positioning the feed; two 7½-hp Eimco air motors, one for each track; and dead man controls located in a convenient, safe position. Individual control of each air motor permits independent operation of each track.

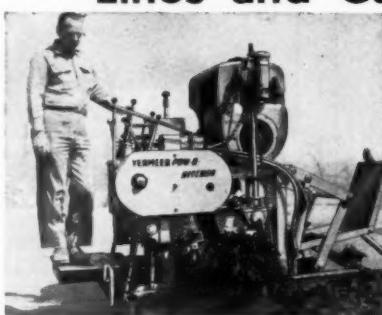
For further information write to



The Blue Brute Port-A-Trac self-propelled wagon drill can be operated by one man.

the Worthington Corp., Worthington and Harrison Avenues, Harrison, N. J., or use the Request Card at page 18. Circle No. 90.

"Best Ditcher For Irrigation Lines and Gas Mains"



"My 4T Pow-R-Ditcher is the best machine I've ever used for irrigation lines and gas mains for the Kansas Power & Light Co. It's the finest small dumper on the market for all-around performance and low cost ditching."

D. Catherman
SALINA CRANE & SHOVEL CO.
Salina, Kansas

VERMEER MIDGET DITCHER DIGS MORE . . . COSTS LESS

Here's just the machine for laying gas pipe, service lines and digging foundation footings. One-man operation. Very maneuverable for those tight spots. Only 48" wide, 6' high, 13' long. Digs 6" to 14" wide and can be transported in a pickup truck. Thousands in use. Write for complete information.

Some Excellent Distributor Territory Available



VERMEER MFG. CO., Pella, Iowa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 356

CONTRACTORS AND ENGINEERS

Off-the-

■ A 30-ton truck that announced inghouse C LW-30 ha like giant dair susp axles.

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Off-the-road rear dump has no axles or springs

A 30-ton off-the-road rear-dump truck that has no axles or springs is announced by the LeTourneau-Westinghouse Co. In place of springs, the LW-30 has four big pistons, acting like giant shock absorbers; the Hydair suspension system eliminates axles.

Also eliminated on the rig are tie rods and exposed steering linkage. The entire steering system is protected within or above the frame line, giving the LW-30 twice the under-clearance of conventional trucks, the company reports.

Chassis grease fittings have been done away with. Special bearings lubed and sealed at the factory need regreasing only if disassembled, the firm reports. Repair time is speeded up by a design that permits the removal of major components without the need for removing other elements.

For example, the LW-30's oscillating torsion-mounted final drive train can be removed as a unit in less than 10 minutes by disconnecting a single radius rod, according to LeTourneau-Westinghouse.

The LW-30 is powered by a four-cycle 375-hp V-8 diesel engine delivering 910 pounds-feet of torque at 1,800 rpm. In addition to multiple-disk air brakes, the rig has an instant-acting electric eddy current retarder, for descending grades under load, mounted in line with the engine flywheel. The retarder is actuated by the first half of the brake pedal's travel; the air brakes are operated by the lower half.

For further information write to the LeTourneau-Westinghouse Co., 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 64.

Pneumatic, hand chisels catalogued in literature

A catalog said to completely standardize pneumatic and hand chisels by point style, body size, and shank type is announced by the Bedford Tool and Forge Co. The catalog includes a chemical and physical analysis of Bedco shock tool steel alloy and gives special emphasis to tool reconditioning methods.

Pneumatic chipping chisels with from $\frac{1}{8}$ to $\frac{1}{2}$ -inch bodies are fitted by U. S. Navy types round or hexagonal shank with 12 standard point styles shown. Scaler chisels are illustrated by hammer manufacturers' retainer styles and standard points.

Also catalogued are round and oval

collar retainer styles from $\frac{1}{2}$ to $\frac{7}{8}$ -inch round bodies. Twelve point styles are listed for each body size and collar type, with complete dimensional detail shown by line illustrations. Charts are used to list parts numbers for each size and style of all chisels for simplified ordering.

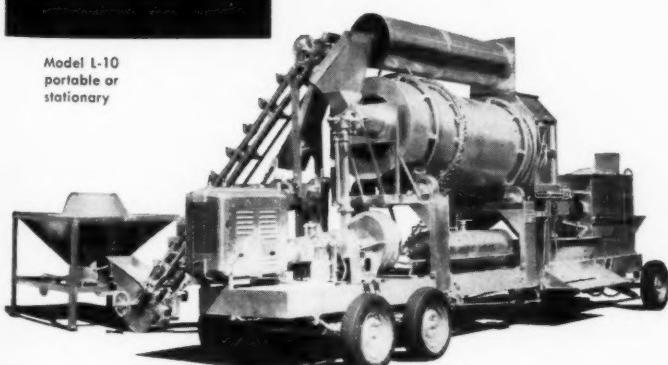
Special shanks such as sheep nose, modified sheep nose, and reverse hexagon are illustrated, along with hand chisels showing four standard and six special point styles.

To obtain this catalog write to the Bedford Tool and Forge Co., Bedford, Ohio, or use the Request Card at page 18. Circle No. 106.

White

NEW ASPHALT PLANT

\$13,500 (f.o.b. factory)



20 tons per hour hot mix capacity

Batch type 1000 lb. pug mixer with air-controlled gates. Has built-in asphalt heating kettle, reciprocating plate aggregate feeder. 50 hp engine or 30 hp electric motor. Write for catalog and name of nearest dealer. White Manufacturing Company, Elkhart 9, Indiana.

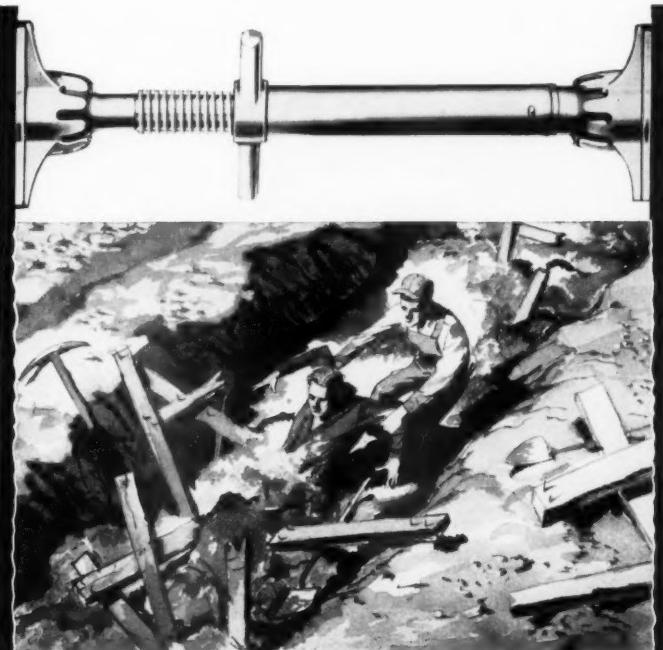
ONE MAN LOADS... ONE MAN OPERATES!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 357

APRIL, 1957



◀ Eliminated from the LeTourneau-Westinghouse LW-30 are springs, conventional axles, tie rods, and grease fittings.



Don't Take Chances With "Make-Shift" Braces

**get safe, dependable, low-cost
Duff-Norton Trench Braces**

Cave-ins of trenches and other excavations can be dangerous and costly. Don't take chances with old timbers or other make-shift devices. See your local distributor for details on prices and delivery of the various types of precision-made, sturdy, Duff-Norton adjustable trench braces and timber fittings... or write the world's oldest and largest manufacturer of lifting jacks for bulletin AD-17S.



Duff-Norton Jacks

DUFF-NORTON COMPANY

P. O. Box 1889 • Pittsburgh 30, Pennsylvania

COFFING HOIST DIVISION: Danville, Illinois

Rachet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks, Rachet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists

For more facts, use Reader-Reply Card opposite page 18 and circle No. 358

159



SUPPLYING CONCRETE for the \$7 million Boeing Airplane Co. hangar at Moses Lake, Wash., presented no problems for the Mount Vernon Sand & Gravel Co., Mount Vernon, Wash. It moved a Noble-Mobile plant, manufactured by the Noble Co., Oakland, Calif., to the job site and had hauls measured in yards. Three to four transit trucks handle the average 350

to 400 yards of concrete required per day. The plant, charged by a scoop-loaded conveyor, requires one or two men for the entire operation. The 8-place hangars will house the B-25 jet bombers while they are being flight-tested by Boeing before they are turned over to the Air Force.

Totes and spreads whopping 27 yards— TIMKEN® bearings whip the loads



LETOURNEAU-WESTINGHOUSE CO. mounts vital moving parts of its Model B Tournapull on Timken bearings to eliminate friction, keep them on the go.

POUNDING shock loads and heavy thrust loads on wheels put wear and tear on this Model B Tournapull as it totes and spreads a whopping 27 yards of material. To help the giant self-propelled scraper keep working steadily and cut maintenance, LeTourneau-Westinghouse engineers specified Timken® tapered roller bearings for the wheels, gear boxes, counter-shaft and 8 other vital working parts.

Taking heavy shock loads is routine work for Timken bearings. Their rollers and races are case-carburized to have hard, wear-resistant surfaces over tough, shock-resistant cores. Full line contact between rollers and races gives Timken bearings extra load-carrying capacity. And Timken bearings' tapered construction lets them take

both radial and thrust loads or any combination. Shafts are held rigid. Gears mesh accurately, wear less, last longer.

Because scrapers and other road machines work under constant clouds of dust and dirt, closures are especially important. Timken bearings keep shafts concentric with the housings, making closures more effective. Dirt and dust stay out; lubricant stays in. Maintenance is reduced.

And Timken bearings practically eliminate friction. That's because they are geometrically designed to have true rolling motion—are precision-made to live up to their design. They roll the load. Bearing life is lengthened. Parts wear longer, too.

To further insure bearing quality,

we even make our own fine alloy steel—America's only bearing manufacturer that does. For your No. 1 bearing value, always look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD

For more facts, use Reader-Reply Card opposite page 18 and circle No. 359

Cement-mortar coating applied with spray gun

■ A special concrete mix which can be applied quickly by spray gun and pressure pot to any desired thickness has been developed by the Chemical Fire and Rust Proofing Corp., in cooperation with Vitron, Inc.

According to the company, the density of the special mix permits the use of a thinner coating and practically eliminates shrinkage cracks. Bond between the mix and such surfaces as steel, concrete, or brick is said to be so tight that wire lath is unnecessary.

The special coating consists of a standard 1 to 1 cement-sand mix to which a small quantity of densifier and bonding agent is added.

For further information write to the Chemical Fire and Rust Proofing Corp., 50 Cutter Mill Road, Great Neck, L. I., N. Y., or use the Request Card at page 18. Circle No. 147.

Diesel air compressor

■ A brochure from the JW Division of Cerlist Diesel, Inc., describes the JW-78 diesel-driven air compressor, a 78-cfm 100-psig self-contained unit available as a portable model with disk wheels, pneumatic tires and fenders, or as a stationary plant for mounting on skids or a truck bed.

The brochure contains specifications for the air compressor and the diesel power unit, as well as physical dimensions for the complete portable and stationary models. Principal design and operating features are described, and a picture diagram illustrates the method of balancing the working forces for smooth operation.

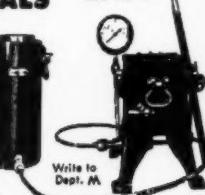
To obtain the JW-78 Brochure write to the JW Division, Cerlist Diesel, Inc., Burlington, N. C., or use the Request Card at page 18. Circle No. 109.

DUDGEON HYDRAULIC JACKS

SALES RENTALS

FOR:
PILE TESTING
UNDERPINNING
BRIDGES
PIPE PUSHING
SOIL TESTING

CAPACITY
TO
600 TONS



Write to Dept. M

DESIGNERS and
MANUFACTURERS OF
**Hydraulic Units
For Special
Applications**

RICHARD DUDGEON INC.
EST. 1850
789 BERGEN STREET BROOKLYN, N. Y.
• ST 8-4040

For more facts, circle No. 360
CONTRACTORS AND ENGINEERS

Off-high takes 2
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APRIL

Off-highway rear dump takes 25-ton payload

An off-highway rear-dump truck equipped with a planetary-gear-drive rear axle and rated at 25-ton payload capacity is announced by the Autocar Division of the White Motor Co. The AP-25, available with either a 335 or 375-hp turbo-diesel engine, has a truck capacity of 16 cubic yards. The planetary-gear-drive rear axle, with the planetary reduction taking place at the outer ends of the axle, is said to reduce torque loads on the differential and the axle shafts. Available optionally is the Allison Torqmatic torque converter and planetary-gear transmission which permits the driver to shift without changing the throttle setting while under full power with a full load. Included in the converter-transmission package is the Allison Torqmatic brake and a direct-drive lock-up clutch.

One of the features aimed at increasing driver comfort and lessening fatigue is the adjustable steering wheel, which can be quickly set to fit any driver. The wheel can be moved forward or back over an arc of 15 degrees, and be raised or lowered 2 inches.

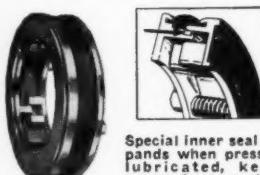
The frame is an all-welded box section constructed of $\frac{3}{8}$ -inch steel and internally reinforced throughout its full length with $\frac{5}{8}$ -inch corrugated steel plate which is plug-welded to alternate sides of the box section at 30-inch intervals.

For further information write to the Autocar Division, White Motor Co., Exton, Pa., or use the Request Card at page 18. Circle No. 70.

A total of 76 contracts costing \$98 million has been awarded for projects on the interstate highway system, according to federal highway administrator B. D. Tallamy.

Protect Your Tractor Rollers Against Grease Loss

Sure-Seal® ROLLER SEALS Give Double Protection



Special inner seal expands when pressure lubricated, keeps grease from reaching bellows.

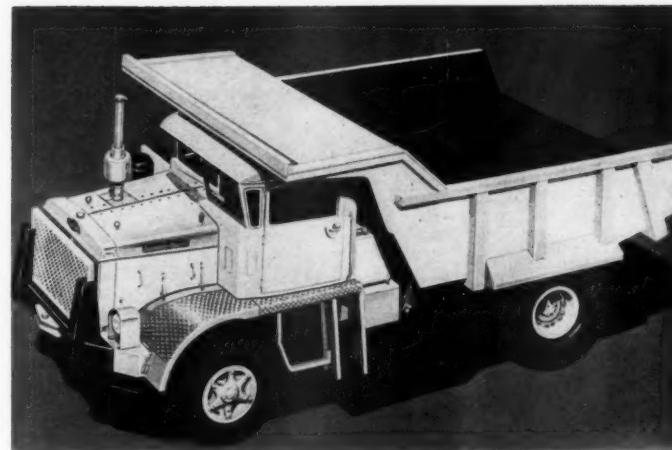
Sure-Seal Tractor Roller Seals have an inner seal in addition to the regular outer seal to lock dirt and moisture out and keep grease in. High pressure lubrication can't hurt Sure-Seals—it seals them tighter from the inside without strain on the bellows. Made for Caterpillar D-4, D-6, D-7, D-8, D-9, TD-14, TD-18 and TD-24. See your tractor dealer.

Locks Grease In—Dirt Out

Sure-Seal Equipment Co. 1820 N.W. 25th Avenue Portland 10, Oregon

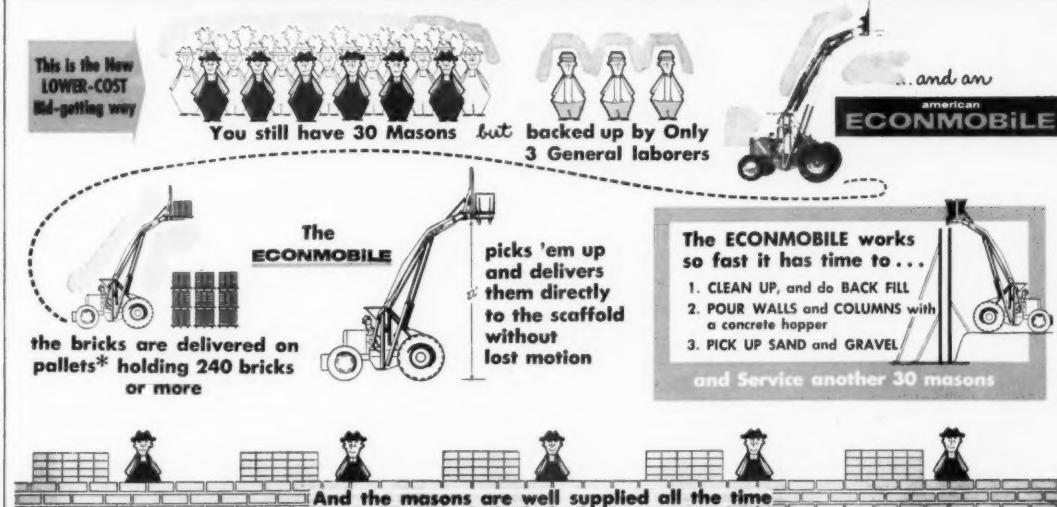
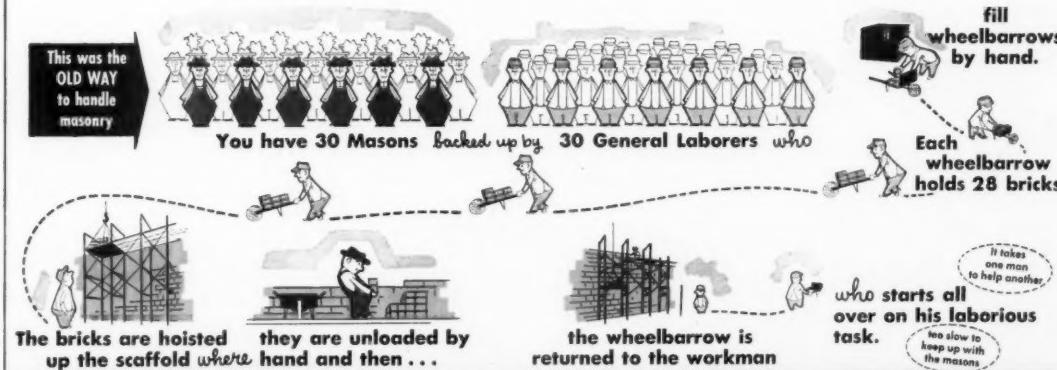
For more facts, circle No. 361

APRIL, 1957



The AP-25 has a planetary-gear-drive axle with the planetary reduction taking place at the ends of the axle. It also features an adjustable steering wheel.

How to Save 80% of your General Labor Costs



In plain dollars
and cents—the
Old Way costs

For 30 general laborers at \$2.00 per hour	\$480.00 per day
For an average job running 200 days the total cost would be	\$96,000.00

*Ask your brick supplier to deliver 'em this way. If he won't, you can do it yourself and still save.

OK! So you want to argue!

Throw in some more general laborers, and you'll still have an unbelievable amount of savings.

OOPS!

We forgot to tell you that there are other savings, like how much do you save when the masons are fully supplied all the time? It will cost you only 3¢ to get the whole story and the proof from one of our 75 distributors and it may be the most important thing you do this year.

Confidentially with savings like this you can pay for an ECONMOBILE at least

12 times

Name _____

Company _____

Address _____

City _____ State _____



American Road Equipment Company
4203 North 26th Street, Omaha, Nebraska

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 362

Trains run on schedule during

tunnel daylighting job



A 400-pound shot of Atlas 40 per cent gelatin primed with Rockmaster caps loosens 1,200 yards of rock to clean the slope of the cut at the east portal over the tunnel. The layer of dirt dozed over the track protects the rails.

The final
shot of the tun-

Carefully engineered blasting to daylight a Rocky Mountain railroad tunnel on the main freight line of the Northern Pacific Railway made it possible for the road to keep to schedule throughout the time it took to remove the 60,000 yards of earth and rock forming the tunnel.

The tricky blasting job, handled by Morrison-Knudsen Co., Inc., Boise, Idaho, was on Tunnel 7 in the Bitterroot range of mountains 45 miles west of Missoula, Mont. This tunnel

ran 89 feet through a huge rock spur jutting from the bank of the Clark Fork River, which the rail line follows from Missoula to Superior. Sheds and portals at either end extended the length of the tunnel to 179 feet.

Two factors combined to make the demolition job necessary. First, the tunnel had been built in 1890 and its old, rotting timbers would have had to be replaced if the tunnel were allowed to stand. Second, its height

of only 18 feet limited overhead clearance on the Northern Pacific's Rocky Mountain Division; with the tunnel out of the way, loads 22 feet high could be carried.

Job done in two phases

In this rugged mountain area where room seldom exists for the construction of temporary bypasses, Morrison-Knudsen had to remove the tunnel without interfering with main line freight traffic. Removal of nearly

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There's no need to gamble when you can bet on a sure thing!

A Better CONSTRUCTION BLOCK For Every Purpose

Illustrated one of many types and sizes of McKissick's Better Blocks. Designed to meet the needs of construction men who require superior quality and efficient operation. All sizes and capacities to meet special requirements. Write for complete catalog.

HI-LIFT CRANE BLOCK, short overall length, flame hardened steel sheaves, hi-speed bronze bushings or roller bearings. One to three sheaves . . . 15 to 60 ton capacity.

McKISSICK PRODUCTS CORPORATION
Box 2496 - Tulsa, Oklahoma

McKISSICK BUILDS A BETTER BLOCK FOR EVERY PURPOSE

McKISSICK

For more facts, use Reader-Reply Card opposite page 18 and circle No. 363

Standard Steel MODEL 55 Tandem Roller



Provides FLUSH CURB Rolling on Each Side

THE MODEL 55 ROLLER was designed to provide two important advantages: (1) Adequate compaction for patch rolling requirements and (2) Ideal roll dimensions for smoothing and finishing work. Ballasting is evenly distributed through the use of both steel and water ballast. Steel ballast is removable in 70# sections providing a wide choice of compaction ranges.

The Model 55 will roll to within 2 inches of wall or building on driver's side and to 4 1/2 inches on opposite side. Eight inch ground clearance provides flush rolling adjacent to curbs. Automatic steering makes easy driving. Up-hoisted seat, safety seat rail, speed control, throttle and foot brake are of motor-car type — and water valve is in easy reach of operator. The maximum weight with all ballast is 4600#. Shipping weight is 3600#. Speed — from 1.75 MPH to 3.5 MPH.

Loading Ramp becomes end gate. Roller locks on trailer for safe travel at all speeds. Write for FREE Catalog and Prices.

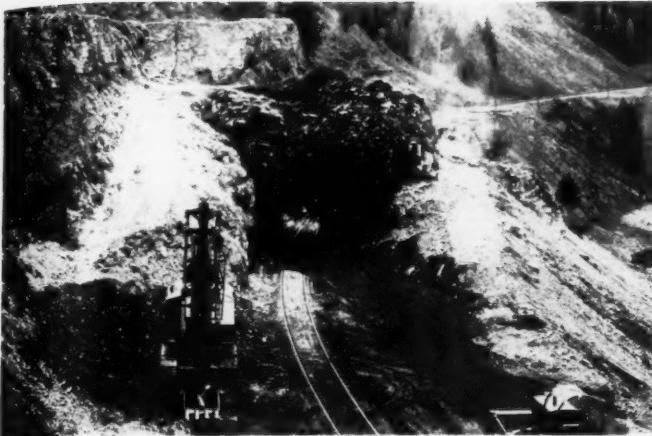


Standard Steel Works, Inc., NORTH KANSAS CITY, MO.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 364
CONTRACTORS AND ENGINEERS

Extra
with
Massive
for ha
material
arms
piping tec

APRIL,



The final shot goes off shortly after the last freight has passed. This was a 500-pound shot, and it brought down 2,000 yards of rock to complete the daylighting of the tunnel.



Working to clear the tracks for the next scheduled train the following morning, a shovel loads the blasted rock to Euclid end-dumps. The rock is wasted along the bank of the Clark Fork River, right.

60,000 yards of material would make it possible for the track to run in a through-cut, 192 feet deep.

M-K handled the work by using shots just large enough so that equipment was able to work efficiently and clean up the rock blasted loose before the next train was due.

There were two distinct phases to the work. First, the slope above the tunnel was cut back to give a slope of $\frac{1}{2}$ to 1 above a 16-foot shelf located 60 feet above grade and a $\frac{3}{8}$

(Continued on next page)

Tractor-Mounted Heavy Duty Loaders for Materials Handling

1 Lifts over 2,000 lb. to full height in less than 7 sec.



2 Built-for-strength tubular steel frame also acts as hydraulic oil reservoir.

3 Trunnion mounted bucket rams won't spring—EVER!

4 Easy access for operator adds to working speed. Full safety protection, too.

A point of SUPERIORity
New pivot position in low-silhouette design gives the Superior loader a 10 ft. 10 in. lift. At the same time the reach—the distance from the front of the loader frame to the edge of the dumped bucket—is a generous 2 ft. 8 in.



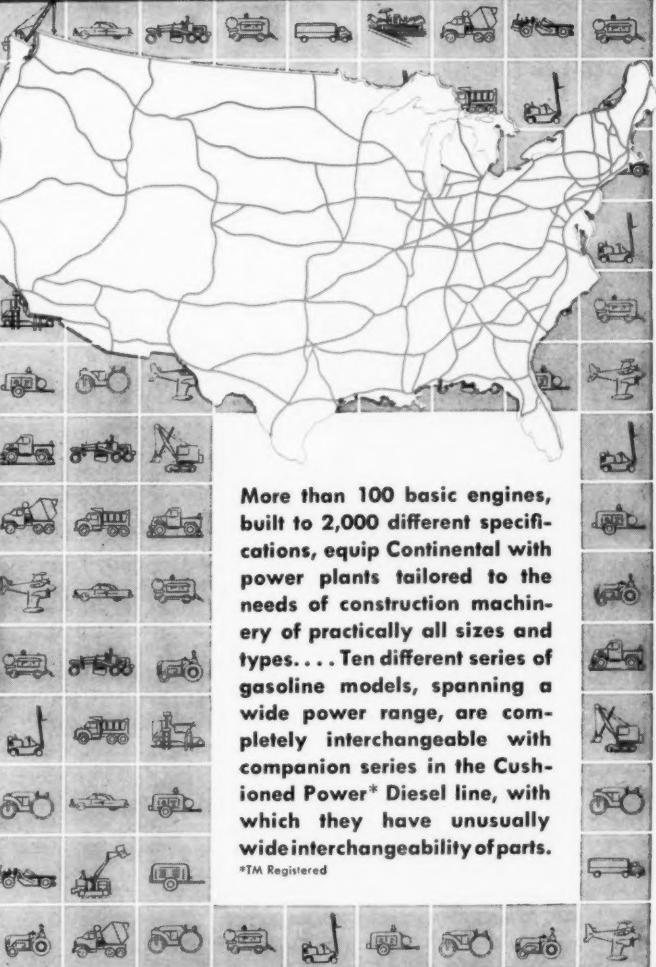
Extra-quick Superior lift action, with front-mounted Vickers pump. Massive (8,900 lb.) pry-out strength for handling heavy or frozen materials. \square -section steel loader arms for rigid strength. Hydraulic piping inclosed in arms for protection. Bucket capacities up to $\frac{1}{2}$ cu. yd. Crane booms, snow-coal and specialty buckets available. Superior loaders can do a variety of materials-handling jobs around your plant, and release more costly equipment for specialized use. Fits most industrial tractors. Write for full performance details.

SUPERIOR EQUIPMENT DIVISION, P.O. Box 341, Wheeling 6, Ill.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 365

APRIL, 1957

MORE Power... BETTER Power... for Every Phase of the BIG ROAD PROGRAM!



More than 100 basic engines, built to 2,000 different specifications, equip Continental with power plants tailored to the needs of construction machinery of practically all sizes and types.... Ten different series of gasoline models, spanning a wide power range, are completely interchangeable with companion series in the CUSHIONED POWER* Diesel line, with which they have unusually wide interchangeability of parts.

*TM Registered

Continental Motors Corporation

MUSKEGON • MICHIGAN

6 EAST 43RD ST., NEW YORK 17, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 50, CALIF.
6212 CEDAR SPRINGS ROAD, DALLAS 8, TEXAS • 1252 OAKLEIGH DR., EAST POINT (ATLANTA) GA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 366

163

(Continued from preceding page)

TOP QUALITY • LOW COST • ADVANCED DESIGN
in all WISCONSIN trailers



\$1140.00 w/deck and
tires plus tax and
freight

Every WISCONSIN trailer is equipped with Timken Bearings, Budd wheels and hubs. General First line tires, No. 1 oak deck 2" thick, and extra large axles. Through controlled production and volume, you pay less for a WISCONSIN trailer than for other similar units. Each WISCONSIN trailer is well balanced for one man operation and has adjustable pintle eye hitch, convenient handles on side of tongue, reinforced internal braces, large heavy duty frame, plus many other advanced features.

See your WISCONSIN Trailer distributor today for more details.

WISCONSIN TRAILER COMPANY 1949 N. 121 St., Milwaukee 13, Wis.
CHOOSEN BY COMPARISON

For more facts, use Reader-Reply Card opposite page 18 and circle No. 367

**CONCRETE JOINTS SAWED
FOR PENNIES PER FOOT!**



Sawing road joints to control cracking is now required in 19 states.

BAY STATE'S NEW REINFORCED ABRASIVE BLADES give you tremendous advantages in economy. Actual experience on both highway and airport jobs shows costs per inch foot of cut between 1½ and 6 cents, depending upon the aggregate.

Specifically designed for wet cutting in green concrete, KRETE-KUT and SAF-T-CUT BZ2 blades are available immediately in all four thicknesses normally required by contracts. The standard 14" diameter readily handles all the depths usually specified, and arbor holes are made to fit each of the popular concrete saws.

Testing KRETE-KUT and SAF-T-CUT BZ2 is the best way to get the lowest concrete cutting costs! Contact your local BAY STATE DISTRIBUTOR, or write to us in Westboro for details.



**BAY STATE ABRASIVE PRODUCTS CO.,
Westboro, Mass., U.S.A.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 368

The entire job required more than 15,000 pounds of Atlas 40 per cent Giant gelatin in 1½ by 12 sticks. Charges were detonated in the holes by Atlas Rockmaster millisecond delay electric blasting caps.

Early phase

Morrison-Knudsen moved onto the job with two Gardner-Denver Air Tracs and two Ingersoll-Rand wagon drills. The bore holes ranged from 6 to 44 feet deep, and the most common pattern was 24-foot holes on 6-foot centers. During the first phase, the average powder factor was 1 pound to 3 yards, but in the latter phase of work it averaged 1 to 4. Three Caterpillar D8's, two shovels, and five Euclid end-dumps cleaned up the blasted material and wasted it along the river bank.

During the first month of work, from three to five freights used the tunnel daily during working hours. An accident on a bridge farther along the line made it necessary for through freight service to be rerouted during the last month of work, and in these weeks, traffic at Tunnel 7 was restricted to a daily round-trip freight between Missoula and St. Regis.

Two and a half months after the job began, the slope had been cut to within 16 feet of the roof of the 89-foot tunnel. All during this time, millisecond delay techniques were successful in providing the fragmentation required for fast loading operations and for shearing the burden cleanly so that sloping operations were minimized.

Open up tunnel

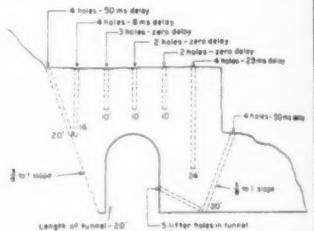
Extremely careful shooting marked the final shots, when all of the rock fell directly on the track.

One shot, designed to provide the proper slope at the east end of the

tunnel and to clear the way for the demolition of the tunnel itself, called for 39 holes, arranged in four rows. The holes varied from 6 feet deep at the near end to 24 feet deep at the far end, and they contained a total of 400 pounds of Atlas 40 per cent gelatin primed with Rockmaster caps delays 0 to 3. The 1,200 yards of rock brought down with this shot was cleared away so that traffic was able to use the track in 3½ hours.

The last 35-foot section of the tunnel, with a 16-foot cover of rock, was destroyed in two shots, one in the morning and one in the afternoon of the same day.

At 8:03 a.m., just after the west-bound local had passed, the next-to-last shot was planned to bring down 15 feet of the bore. This was a particularly tricky shot, because any mistake would have brought down the whole 35 feet of the tunnel and delayed the return of the daily freight.



This drawing shows the blasting pattern for the final shot. A total of 500 pounds of Atlas 40 per cent gelatin was detonated by Atlas Rockmaster caps with delays.

One row of 13 holes, extending across the tunnel roof at right angles to the track, was used for the shot. The holes varied in depth from a minimum of 12 feet at the center. Zero delay Rockmaster caps detonated the center holes above the tunnel proper while 1 and 2 delays

long on service . . .
short on maintenance . . .
just right
on cost!

MANGANAL
TH. REC. 11-PAT-OFF.
11%–13½% MANGANESE-NICKEL STEEL
**MILL LENGTH
HOT ROLLED
WEDGE BARS**

#1834
(7 other sizes, too)

- 14 to 18 foot bars mean less scrap loss.
- Can be bent hot or cold.
- No defects common to castings.
- Long lengths for bucket lips, grizzly bars, etc.

STULL-Z-SICKLES CO. NEAREST DISTRIBUTOR UPON REQUEST
SOLE PRODUCERS 929-39 PORT AVE. • ELIZABETH, N. J.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 369

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The Blaw-Knox Model DTR-552 trench roller compacts widths from 20 to 39 inches.

Dual-drum trench roller compacts varying widths

A new dual-drum trench roller that will compact trenches between 20 and 39 inches wide is announced by the Blaw-Knox Co. The compaction width can be changed while the machine is in motion. The Model DTR-552 can roll to a depth of 24 inches below the existing pavement.

Each compression roll can be steered independently through hydraulic controls, permitting the operator to work to the inside radius of a curve without reducing his speed. The rolls are synchronized with two mated leveling wheels, mounted on pneumatic tires. Two speeds forward and reverse are provided with a low of 1.82 mph and a high of 5.55 mph.

The operator is seated between the two rolls, enabling him to see ahead

regardless of the direction of movement, observing the pavement edges as well as the rolls. Water for the sprinkling system is supplied from a 60-gallon water tank by means of an electric pressure pump operated by foot control.

Power is transmitted to the wheels through heavy-duty chain-driven sprockets. Each roll has a separate brake, built in with differential, to provide both rolls with braking power. Selective additional traction can be obtained by applying the brakes or by locking either side of the braked differential.

For further information write to the Blaw-Knox Co., 300 Sixth Ave., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 91.

(Continued from preceding page)

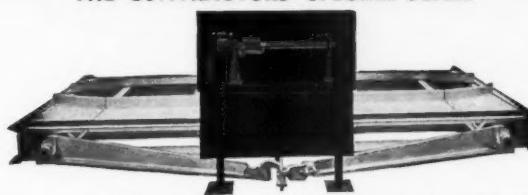
and 25 millisecond delays, respectively—detonated those farther out and along the backslope. The load consisted of 200 pounds of 40 per cent gelatin.

This shot went off as scheduled, the blasted material was loaded out and hauled away, and crews began immediately to load and fire the final

THE END

500-pound shot. This last blast, fired at 1:30 p.m., brought down 2,000 yards of material. All this was cleared away in plenty of time for the passage of the westbound train the next morning. Only light shooting, to attain the desired slope, was done after this to complete the job.

WINSLOW—PORTABLE TRUCK SCALE "THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons. Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY

P. O. Box 1198
Terre Haute, Indiana

For more facts, use Reader-Reply Card opposite page 18 and circle No. 371

FULL RANGE VISION



THE NEW UNIT
Challenger
... as a TRENCHOE

ALL-WELDED BOOM
with Gooseneck Design for Deep Digging

FAST on the Job...EASY to Handle!

Added to the UNIT line of proven equipment, is the New UNIT CHALLENGER. Here's a modern $\frac{3}{8}$ -yard machine that provides a perfect combination of design and construction. Packed with new advanced engineering features: Self-aligning Hook Shoes... Force Feed Lubrication... Full Floating Trunnion-Mounted Tapered Drums... Torque Converter, etc., the New UNIT CHALLENGER is the most dependable machine that money can buy.

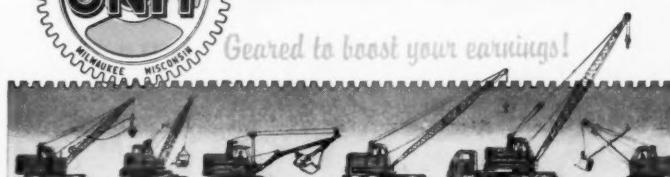
Bulletin C-800 completely describes and illustrates the New UNIT CHALLENGER.

Send for Bulletin Now



UNIT CRANE & SHOVEL CORP.
6309 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared to boost your earnings!



For more facts, use Reader-Reply Card opposite page 18 and circle No. 372

**NEW-FIRST TRANSIT-LEVEL
TO READ TO SINGLE MINUTES!**
TELESCOPE-ERECTING TYPE-24X magnification with objective aperture of 33mm. Stadia constant is 1:00 — This instrument is well constructed for years of service.



\$275.00

F.O.B. SHIPPING POINT

Put This TRANSIT-LEVEL To Work for You . . .
Order today — IMMEDIATE DELIVERY
B. K. ELLIOTT COMPANY
PITTSBURGH CLEVELAND DETROIT BUFFALO
128 SIXTH STREET 636 HURON ROAD 10138 PURITAN AVE. 1702 NIAGARA ST.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 370

APRIL, 1957



AGGREGATES ARE TRANSPORTED from the Saticoy Rock Co. quarry, near Ventura, Calif., to construction projects by this Model 350 Peterbilt tractor-trailer combination. The unit, manufactured by Peterbilt Motors Co., Oakland, Calif., is powered by a 200-hp Model NHB-600 Cummins diesel. The trailer, with aluminum frame and wheels, is within legal weight limits for on-highway duty.

on a
ROSCO
SELF-PROPELLED
ROLLER



YOUR OPERATOR will earn more money for you with Rosco's Model SR-9-0 nine wheel self-propelled, pneumatic tired roller. Here are some of the features that make this machine a real money-maker:

The operator's seat is located for all-around visibility and close operations without "blind spots". Heavy duty, automotive hydraulic power steering reduces operator fatigue...allows more concentration on the job. Ample power for all operating conditions from a heavy duty 4 cylinder, high torque gasoline or diesel engine...multiple speeds forward and reverse...high "over-the-road" travel speeds for fast changes to new job locations.

Rosco's large capacity body is designed for maximum ballast load for proper compaction. Special smooth tread tires provide an evenly rolled path of 69" with overlap. The short wheelbase permits a close turning radius. Drive is through heavy duty, high tensile roller chains and steel sprockets. These are enclosed and running in oil.

This modern, smooth operating SR-9-0 Roller in the hands of your operator will make more profit for you. Ask your Rosco dealer for a demonstration now or write for Bulletin 560B. It contains all specifications and information you'll want to know about Model SR-9-0.



THE BEST FOR BETTER ROADS

3118 SNELLING AVENUE MINNEAPOLIS 6, MINN.

DISTRIBUTORS • MAINTAINERS • ROLLERS •

SUPPLY TANKS • TAR KETTLES • ROAD SWEEPERS • STREET FLUSHERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 373

Bulletin discusses road building and equipment

A bulletin from the Standard Oil Co., "Road Building Equipment", covers the operations in roadbuilding and the equipment needed. The main topics developed are excavating and grading, subbases, surfacing, bituminous surfaces, spreading and finishing, and concrete materials and surfaces.

Other chapters detail the special equipment needed for road widening

and maintenance, engine maintenance instructions, winter operations, storing idle equipment, hydraulic system maintenance, and the mechanization behind the finisher. Job photos, flow charts, and diagrams illustrate the technical data.

Engineering Bulletin RB-214, "Road Building Equipment", may be obtained from the Standard Oil Co., 910 S. Michigan Ave., Chicago 80, Ill.



ALL-NEW MASTER TURN-A-TROWEL HAS POWER BLADE ADJUSTMENT

"This sure beats workin'", said one operator after he'd tried the all-new Master "Powermatic" 34" trowel. "I've never had it so easy in my life...or done a better job."

No wonder he likes it. He pushes or pulls a knob and *engine power* tilts the combination blades to float or finish.

Know what that means? He gets exactly the job he wants, faster and easier.

He doesn't have to "fight" this trowel, either. The Master's only 14" from the slab to the top of the engine...has the *lowest center of gravity* of any power trowel. Wobble's a thing of the past. And the direct drive puts *all* the engine's power to work.

You'll like the all-new Master, too. The *automatic* clutch that lets the Briggs & Stratton engine get to operating speed before engaging the blades. The "dead man" control that *idles* the engine when you let go the handle. The stationary guard ring. They all make troweling easier and better.

The all-new Master in 34" gasoline-drive is now ready. Three or four blades, whichever you prefer. *Power blade-adjustment, direct drive, lowest center of gravity* and other new features make it your best buy. You'll like it. See it at your distributors or write us for full details.

MASTER

MASTER VIBRATOR COMPANY
609 Stanley Avenue, Dayton 1, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 374

CONTRACTORS AND ENGINEERS

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Loader can discharge at front or over rear

A diesel-powered hydraulic loader that can discharge at the front or over the rear is available from the Seaboard Equipment Co. The two-way loading feature permits straight line operations without pivoting the machine from stockpile to dump truck.

The Merton Two-Way Loader can discharge at a height of 9 feet at either end. The bucket descends to ground level in front and to 4 1/4 feet above the ground in the rear. The rig has a speed of 13 1/2 mph.

A 1/2-cubic-yard bucket and a 24-second operating cycle are reported to give the Two-Way loader an output

of approximately 100 cubic yards per hour. Spillage is almost eliminated because the design and action of the bucket tilt arms maintain the bucket in a horizontal position through the course of its travel, the company reports.

Optional equipment available for the Merton loader include hydraulic steering, a 1 1/4-cubic-yard bucket, bucket teeth, a rear power takeoff, and a 7-foot bulldozer blade.

For further information write to Seaboard Equipment Co., Inc., 7 Hanover St., New York 5, N. Y., or use the Request Card at page 18. Circle No. 67.

JUST ONE MAN LOADS 13 TONS IN TWO MINUTES!



on a MILLER tandem Tilt-Top!

Model "OT"-13
tandem \$2,295.00*

You can put wheels under BIG equipment FAST, with a MILLER Tilt-Top. There's no need to bother with the extra loading time . . . extra cost of larger, more cumbersome trailers. With a MILLER OT-13 it takes ONE man less than TWO minutes to load this big Barber-Greene paver . . . and be off to the next job with no lost motion. This faster loading, precise easy backing, on-a-dime maneuverability, cuts time between jobs . . . ups profit—production time for men and equipment every day! Tilt-Top from 3 to 15 tons capacity—equipped with single or tandem axles . . . over, or between-the-wheels platforms . . . puts mobility, under dozers, pavers, rollers and trenchers of almost any size or shape.

Tandem Tilt-Tops ride on heavy box section walking beams that provide independent wheel action on each side for a more level ride and less jarring over rough terrain. It is one of the few trailer walking beams mounted on trouble-free Timken roller bearings.

And you pay no premium for quality—no comparable trailer undersells a MILLER! Compare these time saving, production boosting Tilt-Tops at your MILLER distributor now—you'll be surprised how ruggedly they are built . . . how little they cost!



Model "BT"-10
tandem \$1,630.00*

*F.O.B. Milwaukee
Complete with platform and tires. Any optional equipment extra.
*Plus 10% Federal Tax

✓ built best
✓ priced best

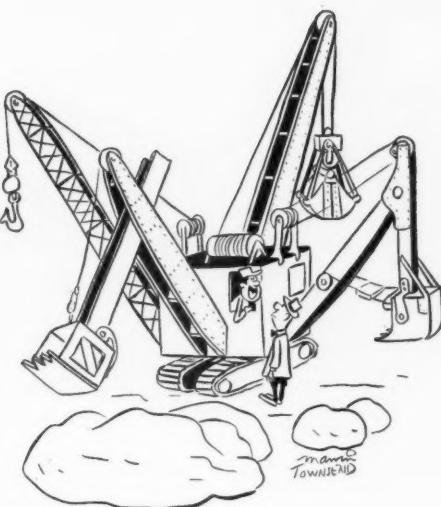
MILLER
Tilt-Top Trailer Inc.

See your MILLER distributor or write for FREE literature to: 456 S. 92nd St., Milwaukee 14, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 375

APRIL, 1957

"It cost plenty, but we're always prepared to tackle any type of job."



yes sir...
we can
fill your
order
immediately!

men of the highway construction industry know
they can depend on . . .

ONE DEPENDABLE
SOURCE FOR . . .



- Expansion Joints; Premoulded Asphalt, Fibre, Corkfill, Sponge Rubber, Plain Cork and Self-Expanding Cork Types.
- Tongue and Groove Center-strip.
- Dummy Joints.
- Hot and Cold Pour Rubber-Asphalt Seal.
- Hot and Cold Pour Jet-Fuel Resistant (JFR) Joint Seal.
- Concrete curing compounds (clear and white Pigmented types)
- Air Entraining Agent.
- "PREMOULDED MEMBRANE" Vapor Seals
- "HYDROMAT" Asphalt Liners
- "DURAJOINT" Waterstops.
- Plus many other paving and building products.



Write today for complete information.

SEALIGHT®
PRODUCTS FOR BETTER CONSTRUCTION
W. R. MEADOWS, INC.

13 KIMBALL STREET
ELGIN • ILLINOIS

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 376

W. R. Meadows, Inc.
Kimball St., Elgin, Illinois
Gentlemen:

- Send my copy of your Sealight Paving Products Catalog.
 Have representative call.

NAME _____ TITLE _____
FIRM _____
ADDRESS _____
CITY _____ STATE _____

167



The new White Model 9064 can take a 7½-cubic-yard concrete mixer or an 8-cubic-yard dump body.

HOW TO HANDLE WET JOBS

#37 of a Series

ONE LIFT REMOVES 18 FT OF WATER FROM "PATCH-QUILT" SOIL

Sewage treatment plant, Clayton, N. J.
Contractor: C & T Affiliates, Inc.



SOIL on this job varied by area—fine silty sand here—coarse sand there—gravel a few feet away. This "patch-quilt" pattern precluded routine handling.



GRIFFIN engineers carefully planned proper installation for each wellpoint, using sand filters on some but not others.

This plus other special methods lowered the 18 ft of water with a money-saving single-stage wellpoint system. Top photo shows system placed directly at water level.

GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

For more facts, circle No. 377

168

New six-wheeler handles 7½-yard concrete mixer

A new tandem-axle construction chassis unit that will take a 7½-cubic-yard concrete mixer or an 8-cubic-yard dump body is announced by the White Motor Co. For mixer service, the Model 9064 is available with a special front power takeoff.

The truck is powered by a White Mustang gasoline engine delivering a maximum brake horsepower of 145 at 3,000 rpm and 328 pound-feet of torque at 1,250 to 1,500 rpm. It is available with wheelbases of 158, 173, 180, and 186 inches. Front axle capacities range up to 15,000 pounds; rear axle capacities range up to 44,000 pounds.

The Model 9064 has a double-channel chrome-manganese heat-treated steel frame. The model with the 180-inch wheelbase has power steering as standard equipment. The main transmission has five forward speeds and one reverse, and the auxiliary transmission has three speeds.

For further information write to the White Motor Co., 842 E. 79th St., Cleveland, Ohio, or use the Request Card that is bound in at page 18. Circle No. 62.

INGRAM

with NEW
REVERSE - O - MATIC



See our exhibit
at the Road Show

For more facts, use Reader-Reply Card opposite page 18 and circle No. 379

ACME IRON WORKS

P.O. BOX 2020 • SAN ANTONIO 6, TEXAS

CONTRACTORS AND ENGINEERS

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A COMPLETELY REDESIGNED truck, incorporating the Clark power train, is featured in the Michigan Model T-20 excavator-crane introduced by the Clark Equipment Co. For steel erection, the T-20's maximum boom length is 80 feet with 10 to 15-foot jib booms. A 134-hp gasoline chassis engine permits travel speeds up to 35 mph. For more details circle No. 107 on the Request Card at page 18 or write to the Clark Equipment Co., Construction Machinery Division, Pipestone Road, Benton Harbor, Mich.

New Features Dotmar CURB AND GUTTER PAVER

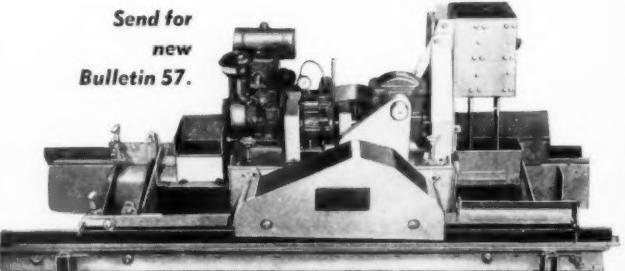
THAT MEAN GREATER PROFITS TO CONTRACTORS

VIBRATOR on rear hopper assures smooth troweling — no dragging or tearing. Air supplied by compressor and tank on machinery deck.

New TRANSMISSION provides smoother operation—convenient lever for Neutral, Forward and Reverse. Power Grip Timing Belt between engine and transmission.

MECHANICAL TAMPER in front hopper eliminates hand tamping and spading. Three men and a Dotmar can lay up to 10 linear feet per minute. Lays sidewalk too. Pays for itself in first mile of paving.

Send for
new
Bulletin 57.



Makers of Air Ace Hammer and Tools
The size of a pistol—power like a cannon

Ask about Porta-Mixer, the hydraulic loader-mixer for tractor shovels.

Dotmar INDUSTRIES INC.

519 HANSELMAN BUILDING KALAMAZOO, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 378

Ingram rollers with the reverse-o-matic drive permits no-stop power shifted reversing. Reverse-o-matic can be shifted while the roller is moving, therefore there is no delay for clutching or shifting gears. There is no maintenance required, no adjustments to be made and no clutches to replace. The reverse-o-matic furnishes smooth shockless power that reduces engine wear and prolongs life of other power transferring mechanism.

All these advantages show that an Ingram roller equipped with "Reverse-o-Matic" furnishes the most practical roller you can use.

See and get the facts on Ingram before you buy your next roller.

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APRIL

Highway warning flasher makes use of transistors

A highway warning flasher that makes use of transistors is available from the R. E. Dietz Co. Because the transistors require less space than conventional vacuum tubes, the new flasher is smaller and more compact than units using tubes.

The transistorized flasher is available in four models: 360-degree and two-faced models for highway bar-



One of four models of Dietz transistorized warning flashers.

racles, and 360-degree and two-faced models for traffic cones. The flashing rate is 60 to 70 times per minute. Yellow lenses are used on all models because they provide good visibility and do not conflict with red stop lights and traffic signals.

The two barricade models operate at 6 volts, using either one or two standard electric lantern batteries with a life of 1,200 hours. The traffic cone models operate on four standard "D" cells and an incandescent bulb. The life of the flashlight batteries is 750 hours.

Transistorized flashers are said to cost less, require less power, be more rugged, require less space, and last much longer than conventional units with vacuum tubes.

For further information write to the R. E. Dietz Co., Electronic Flasher Division, 225 Wilkinson St., Syracuse, N. Y., or use the Request Card at page 18. Circle No. 128.

Truck-loader bulletin

A bulletin describing the operation of the M-B truck-loader and detailing its specifications is available from the M-B Corp. The hydraulically-operated loader is adaptable to most trucks.

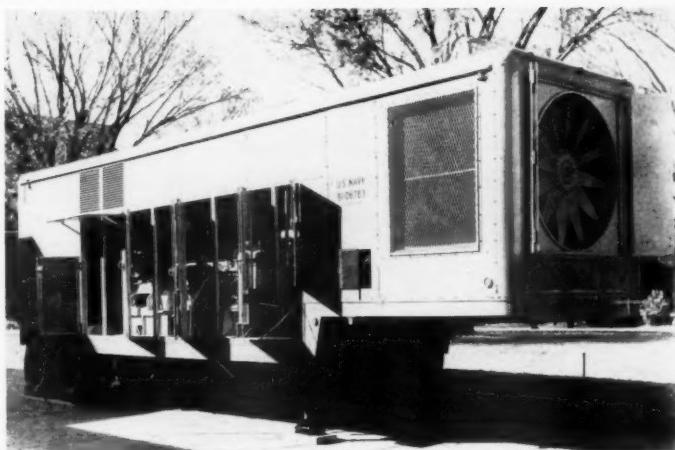
The bulletin explains in detail the hydraulic "jaw" that reaches out and draws materials into the bucket, providing a full load without ramming the truck into the pile.

To obtain Form No. 200 write to the M-B Corp., 1635 Wisconsin Ave., New Holstein, Wis., or use the Request Card at page 18. Circle No. 110.

AWS elects Hoglund

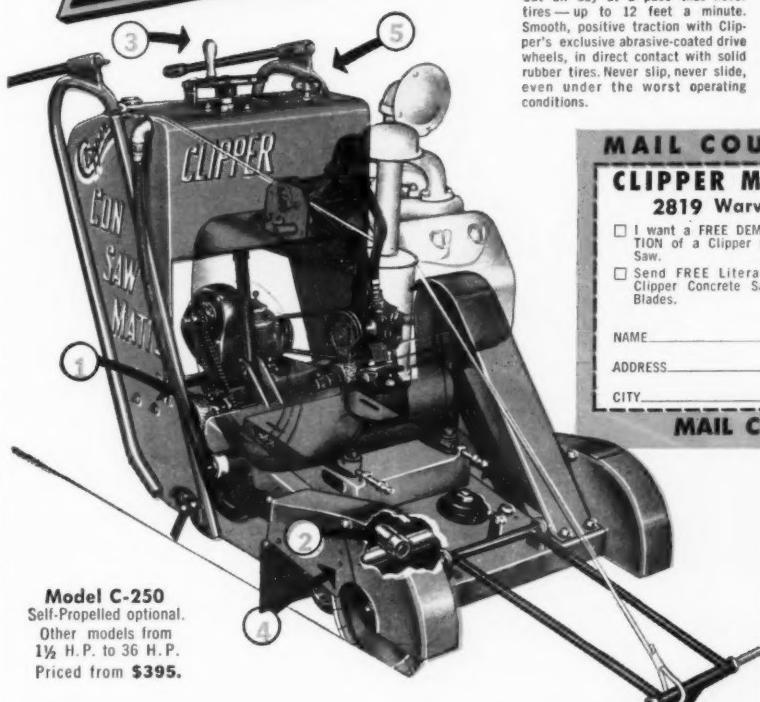
The American Welding Society, Inc., has elected G. O. Hoglund first vice president for a one-year term starting in June. Hoglund is the head of the joining section of the process development laboratories of the Aluminum Co. of America, Pittsburgh.

SAID TO BE THE WORLD'S most powerful trailer-mounted diesel generating plant, this mobile power station built by Fairbanks, Morse & Co. is being used by the U. S. Navy's Bureau of Yards and Docks as an emergency power source. Rated at 675 kilowatts for continuous heavy-duty service, the power station includes an F-M Model 38D8-1/8 opposed-piston diesel rated at 962 horsepower at 720 rpm; a generator; a switch gear and control equipment; a starting air compressor; and an auxiliary engine. For more information on this and three smaller trailer-mounted generating stations write to **Fairbanks, Morse & Co.**, 600 S. Michigan Ave., Chicago 5, Ill., or circle No. 108 on the Request Card at page 18.



Clipper CONCRETE SAWS

CUT MORE CONCRETE AT LESS COST With CLIPPER CONCRETE SAWS



Model C-250
Self-Propelled optional.
Other models from
1½ H.P. to 36 H.P.
Priced from \$395.

THESE EXCLUSIVE CLIPPER FEATURES GIVE YOU THE LOWEST CUTTING COST PER FOOT

- ① Self-Propelled with Abrasive Coated Drive Wheels.
- ② 4 Wheels with 3-point, No-Bind Blade Suspension.
- ③ Positive Screw Feed.
- ④ Patented Water Application.
- ⑤ Dashboard Controls.

Yes... Clipper's SIMPLE Design... RUGGED construction... DEPENDABLE performance gives you a fast powerful Concrete Saw for heavy production cutting on all concrete and asphalt jobs. EXCLUSIVE Clipper Features include SELF-PROPELLED unit with ABRASIVE

COATED DRIVE WHEELS and rear wheel drive for powerful forward thrust. POSITIVE SCREW FEED—a "MUST" when using low-cost "Green-Con" Abrasive Blades to compensate for diminishing blade diameters. Protects valuable diamond blades from bumping and scraping. A Positive Control AT ALL TIMES.

Clipper SAILS RIGHT THRU
MANUFACTURING CO., KANSAS CITY 8, MO.
Sold Direct by Factory Trained Representatives
From Factory Branches in Principal Cities—Coast to Coast.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 380

DIAMOND BLADES



Clipper Diamond Blades are made for any job—any aggregate—every saw! Choose your Clipper Diamond Blade from a wide variety of specifications to cut green or old concrete with outstanding speed and economy. IF YOU DON'T KNOW DIAMONDS, KNOW YOUR MANUFACTURER.

MAIL COUPON FOR FACTS

CLIPPER MANUFACTURING CO.
2819 Warwick • Kansas City 8, Mo. 411X

- I want a FREE DEMONSTRATION of a Clipper Concrete Saw.
 Send FREE Literature on Clipper Masonry Saws and Blades.
 Send FREE Literature on Clipper Concrete Saws and Blades.

- Have a Clipper representative call on me.

NAME _____
ADDRESS _____
CITY _____ STATE _____

MAIL COUPON TODAY!

GREEN-CON® ABRASIVE BLADES



Savings as high as 80% with Clipper's New Reinforced Green-Con Abrasive Blades. A range of specifications for all types of limestone aggregates, as well as harder aggregates, when mixed with limestone. Green-Cons are available to cut 3/16" - 1/4" - and 3/8" wide joints.

FOR CLIPPER QUALITY AND LOWEST POSSIBLE COST...
LOOK for the BRIGHT ORANGE COLOR—with the trade mark CLIPPER

which identify genuine Clipper Quality. Manufactured under the most advanced Quality Controls known to the industry—your assurance of consistent quality and peak performance, rim to stub, blade to blade.

"Summerize" those engine cooling systems now

**THE NEW
POWER-PACKED HEAVY-DUTY
Cardinal 1957 MASONRY SAW**

with new improved Micrometric Head Height and Head Angle Adjustments

2 HP Continuous Duty Motor as Standard Equipment

NEW MICROMETRIC HEAD HEIGHT ADJUSTMENT
NEW MICROMETRIC HEAD ANGLE ADJUSTMENT
100% MORE CONTINUOUS POWER
QUICK, SIMPLIFIED VOLTAGE CHANGE
AMAZING "BLADE SAVER" PRESSURE REGULATOR
SENSIBLY PRICED!

The power, efficiency, low initial cost and production possibilities of this amazing new *Cardinal* '57 MASONRY SAW surpass any masonry saw on the market today.

On your next tough job... on hard, medium or soft materials... try the *Cardinal* '57 Saw... you'll get effortless performance, hour after hour—wet or dry, for top performance and maximum life from ANY make of masonry blade. Send for Bulletin MS-57 and latest price list.

Cardinal ENGINEERING CORPORATION
 144 BURNSIDE ST., PHILADELPHIA 27, PA. U.S.A.
World's Largest Manufacturer of Abrasive and Diamond Masonry Blades and Saws

... and **BLADES**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 381

WILKINSON LINE LOCATOR FOR GREATER PROFITS . . .

... IN YOUR HIGHWAY GRADING
and DITCHING OPERATIONS

1. Spots all pipe and cable locations before uncovering preventing damage, expensive repairs and lost time.
2. Indicates depth too.
3. Leading contractors everywhere use it to reduce job costs and speed excavating operations.



WILKINSON PRODUCTS COMPANY
 3987 Chevy Chase Drive — Pasadena 3, California — SYlvan 0-4314

For more facts, use Reader-Reply Card opposite page 18 and circle No. 382

It is just as important to prepare cooling systems of vehicles for hot weather as it is for cold. Unless all winter-worn anti-freezes are drained out—including the so-called permanent types—the result may be overheated engines or more serious damage.

Corrosive anti-freeze solutions are a major cause of overheated engines. These solutions eat into the vital parts of the cooling system, producing rust, which clogs up the radiator and narrow water passages in the engine block. Overheating can also mean serious engine damage, such as scored cylinders, warped cylinder heads, seized motors, and burned and sticky valves.

Many overheating troubles can be traced to a general misunderstanding of the word "permanent" in anti-freeze. It really means all winter long, or seasonal, not year after year. For example, all so-called permanent types can turn into acids in cooling systems after one season's use. Air and exhaust gases, seeping into the cooling system, oxidize the glycol, forming harmful acids. As these acids form, they are neutralized by rust inhibitors. In time, the inhibitors become depleted, leaving the solution dangerously corrosive. For this reason, it is more economical to drain out and discard the worn solution, and install fresh anti-freeze in the fall.

Owners should not be misled by hydrometer readings showing that winter-worn solutions still afford adequate protection against freezing. There is no way the hydrometer can simultaneously indicate whether the anti-freeze solution has turned acid and is excessively corrosive.

Adding a fresh supply of rust inhibitor to winter-worn solutions temporarily slows up corrosive action, and it cannot eliminate the damaging acid salts already formed.

For safe, trouble-free operations, the National Bureau of Standards, automotive authorities, and anti-freeze manufacturers recommend draining out and discarding winter-worn anti-freeze solutions from the radiator and engine block. This involves cleaning and flushing the cooling system, using a chemical cleaner, if necessary; checking all parts of the cooling system for leaks or wear, replacing or repairing necessary parts; refilling the radiator with fresh water; and adding a chemical rust inhibitor.

THE END

Jay Co. appoints two

T. T. Mosier has been appointed general sales manager in charge of all territories, domestic and foreign, for the Jay Co., Columbus, Ohio. Mosier was formerly a partner and sales manager with the Cleen Products Co., Columbus.

The central zone field representative, Paul O. Stentz, has been promoted to assistant general sales manager.

CONTRACTORS AND ENGINEERS

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Frameless bulk trailer unloads from any angle

A frameless dry-bulk trailer that can be automatically unloaded from any angle or slope by power-driven screw conveyors within the tank is available from the Highway Trailer Co. Dual outlets at the rear of the trailer permit discharge at the rate of up to seven barrels per minute.

The discharge screws are powered by a four-cylinder 25-hp V-type air-cooled engine with its own starter, generator, battery, and air filter. Grease-sealed bearings are used throughout all drive operating parts.

Cargo is completely discharged by means of the conveyors. Hinged, watertight, 24-inch manholes atop the unit are said to permit fast loading and are easily accessible by both the front ladder and the rear steps.

An adjustable fifth wheel and lightweight, telescopic drop-type supports are standard. Vertical two-speed supports, made of steel or aluminum, are optional. The chassis is equipped with a lubrication-free Highway Progressive tandem axle.

For further information write to the Highway Trailer Co., 405 E. Fulton St., Edgerton, Wis., or use the Request Card at page 18. Circle No. 131.

Hose accessories

A compilation of its standard-type hose clamps, grooved hose fittings, and special tools and replacement parts is contained in a new catalog from the Punch-Lok Co. Separate sections of the catalog are devoted to detailed coverage of such subjects as the Punch-Lok method, uses and applications, and how to apply Punch-Lok clamps.

To obtain this booklet write to the Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill., or use the Request Card at page 18. Circle No. 117.

Use of torque converters

The story of torque converters in general and the Allison Torqmatic Drive in particular is told in a 46-page booklet from the Allison Division of General Motors. The booklet is entitled "The Road to Greater Equipment Output".

Included in the booklet are sections explaining the principle and operation of the torque converter, detailing its development and advantages, and describing the various models of Torqmatic Drive converters and converter-transmission combinations available from Allison.

Another section is devoted to describing the servicing set-up maintained by Allison all over the country. Throughout the booklet are illustrations of various pieces of construction machinery utilizing the Torqmatic system.

To obtain "The Road to Greater Equipment Output" write to the Allison Division, General Motors Corp., Box 894, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 115.

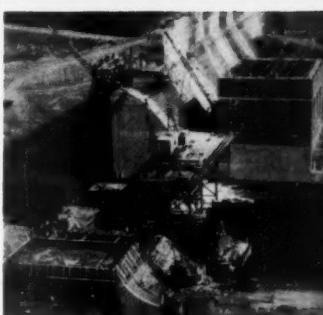
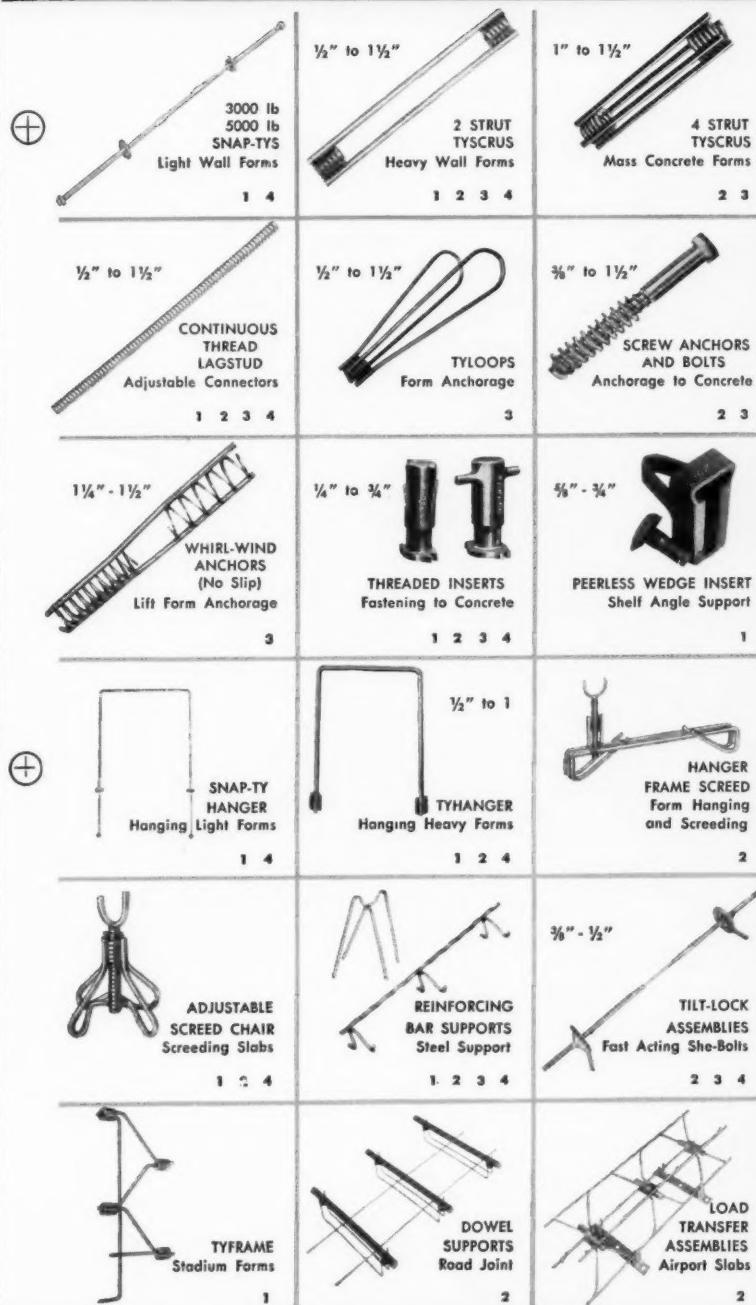
For more facts, circle No. 383—

Power-driven screw conveyors within the tank unload dry-bulk materials through the dual rear outlets of this Highway frameless trailer from any angle or slope.



RICHMOND REFERENCE GUIDE FOR YOUR CONCRETE CONSTRUCTION NEEDS

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buildings 1

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GUIDE
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Richmond
SCREW ANCHOR CO., INC.

816-838 LIBERTY AVENUE • BROOKLYN 8, N.Y.
315 SOUTH FOURTH ST • SAINT JOSEPH, MO

The Chester nine-wheel Model 9W P. D. self-propelled pneumatic compactor has a maximum compactive effort of 2,000 pounds per wheel with water and sand ballast, and optional six-ply 7:50×15 treadless tires inflated to 34 pounds.

No Matter What
SIZE... No Matter What
SHAPE...

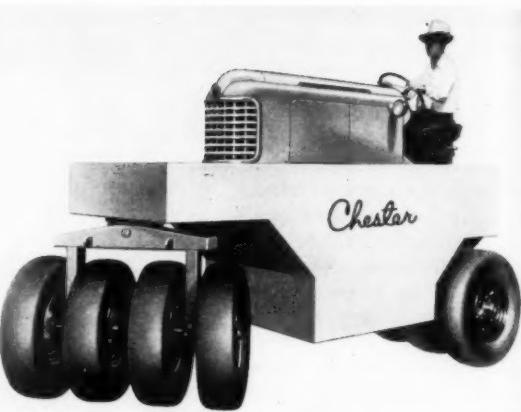
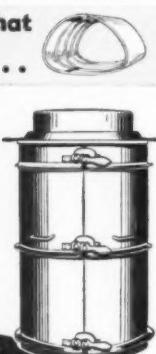
QUINN CONCRETE PIPE FORMS

Set The STANDARD For Producing Quality Pipe!

Over 50 years of experience go into the production of every Quinn Concrete Pipe Form. That's why the Quinn Heavy Duty form is recognized as the STANDARD the world over for producing quality concrete pipe at the lowest cost. Used in making pipe by vibration, spading, or tamping. Sizes for pipe 10" to 120" and larger. Tongue and groove (as shown) or bell end pipe in any length desired. No matter what size, shape, or length pipe you need, there's a Quinn pipe form made to fit your requirements. Write today for our FREE catalog and estimates.

Also Manufacturers of QUINN CONCRETE PIPE MACHINES
Quinn WIRE & IRON WORKS BOONE, IOWA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 384



Nine-wheel roller gives cover-all compaction

■ A self-propelled multi-wheel pneumatic compactor designed for base, subbase, bituminous paving, and soil-cement compaction is available from the Chester Products Co. Nine rolling wheels with 7:50×15 treadless tires are pair-mounted for maximum oscillation in a "cover-all" pattern with four wheels in front and the rear wheels extending beyond the body in order to permit operation close to obstacles.

Maximum compactive effort is 2,000 pounds per wheel with water and sand ballast and optional six-ply 7:50×15 tires inflated to 34 pounds. The body is constructed with a drop-center design to maintain a low center of gravity. It has a 75-cubic-foot ballast capacity. Rolling width is 66 inches, ground clearance is 9½ inches, and body height is 47 inches. Construction of the fifth wheel permits short radius turns, the company states.

Other features of the Model 9W P.D. are power steering, double-disk brakes, an elevated operator's seat, and a reliable gasoline engine. A 13-wheel model with a 93-inch compaction width is also offered. Eleven and 15-wheel models are available on special order.

For further information write to the Chester Products Co., N. Fifth and Ford Blvd., Hamilton, Ohio, or use the Request Card at page 18. Circle No. 146.



Simple Design... Direct Power Flow

EXCLUSIVE SLIDING PINION arrangement (circle) makes use of only one set of clutches for travel, swing and boom hoist. Only working gears turn—all others are disconnected—for full power at the dipper.

ONLY 3 MAIN SHAFTS cross the rotating bed. FEWER GEARS AND PINIONS—only 17 are needed in the Model 3000.

GREATER ACCESSIBILITY reduces downtime for maintenance and servicing.

SEE YOUR DISTRIBUTOR NOW!

MANITOWOC
SHOVELS CRANES
1-5½ YD. 20-100 TON
Speed Drive

For more facts, use Reader-Reply Card opposite page 18 and circle No. 385

Successful contractors base their bids on a Manitowoc's ability to produce big yardage output—in less time—at lower cost. For instance, R. J. Nichols of New Bethlehem, Pa. uses a Manitowoc 2-yd. Model 3000 shovel to tackle a \$1,134,000 highway job for the State of Pennsylvania. The work involves widening a 10 mile, 2-lane highway 4' on each side and eliminating dangerous curves. An estimated 165,000 yards will be excavated before the job is completed. As a long-time user of Manitowoc equipment, Mr. Nichols, like many other prominent contractors, knows he can depend on his shovel to deliver more speed, reach and power to finish the contract on time—at a profit.

More "LOW-BID" Features

Simple Crawler Drive has positive, jaw-type steering—extremely maneuverable in tight quarters. **Completely Enclosed** travel gears and clutches keep going longer with less downtime. **Simple, Accessible Main Machinery** makes full use of power—is easy to get at for convenient servicing. **Dependable, Disc Type Clutches** are easily adjusted, with discs replaceable in minutes. **Smooth-Acting Air Controls** are available to keep your shovel runner at top operating efficiency the entire shift. **Self-Removing Counterweight** is available for fast, simple moves between jobs within highway load restrictions.

Bid more profitable jobs with Manitowoc—check the finest first, then decide!

Manitowoc Engineering Corp., Manitowoc, Wis.

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CONTRACTORS AND ENGINEERS

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The Model DB-60 Power Buggy is an improved version of the Model DB-52. Both have a capacity of 12 cubic feet of concrete.

Concrete power cart has 12-cubic-foot capacity

A new model of the Whiteman Power Buggy for handling concrete has been announced by the manufacturer. The Model DB-60 represents an improved version of the Whiteman Model DB-52 Power Buggy.

The Model DB-60 carries 12 cubic feet of concrete. It will travel at speeds up to 16 mph, negotiate 25 per cent grades, and turn in its own radius.

The improvements reported include a heavier, solid-casting rear frame for strength; new type wheel clutches that engage quickly for smooth starts; and ball bearings in the steering column with adjustments for wear.

For further information write to the Whiteman Mfg. Co., 13020 Pierce St., Pacoima, Calif., or use the Request Card at page 18. Circle No. 87.

Brunner & Lay open plant

Brunner & Lay, Inc., Franklin Park, Ill., have opened a new plant in Denver, Colo., at 2 Santa Fe Drive. The new plant will carry a complete stock of B&L tools.

SAVE MONEY! UNUSED 6X6 ARMY TRUCKS



*** From Government Storage!**
*** Unused and Guaranteed!**
*** Factory New Condition!**
*** Reconditioned Trucks also Available!**

Save up to \$3,000 on one of our unused Army trucks. See for yourself how TWO of our trucks cost you even LESS than one new truck.

Compare our Tandem Axle Trucks with front wheel drive, 10 forward speeds, overdrive and new mud and snow tires with similar equipment elsewhere.

Investigate now! . . . There's no obligation . . . and we deliver on approval!

For Specifications, Prices, Delivery Write, Wire or Phone Collect—Jackson 5-7641
MILTON Y. TOOMBS, JR.
Sales Manager

MEMPHIS EQUIPMENT COMPANY
CONSTRUCTION AND AUTOMOTIVE EQUIPMENT AND PARTS
768 SO. THIRD ST. MEMPHIS, TENNESSEE

For more facts, circle No. 386

Smooth-bore suction hose bends without buckling

A new crush-proof smooth-bore suction hose is announced by the Continental Rubber Works. Vitalic "368" utilizes corrugated construction to permit greater bends without buckling. Both tube and cover are made of thick rubber compounded to resist the toughest abrasion encountered in construction work, the company reports.

A special springy Stycon rubber cord is used in the Vitalic "368" instead of wire. The Stycon cord is embedded in rubber between multiple plies of high-grade hose duck. This gives the hose greater resiliency, the company states, so that it snaps back quickly when flattened for any reason.

The new hose is available in lengths



up to 50 feet in diameters of 1½, 2, 2½, and 3 inches.

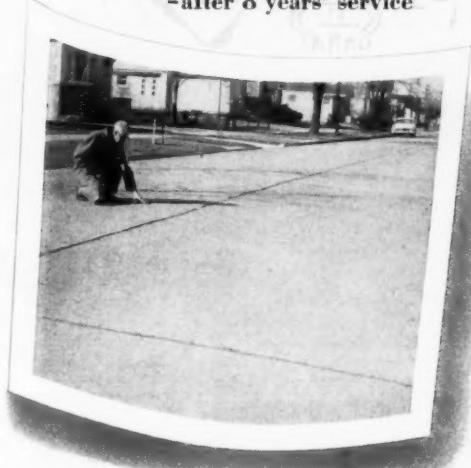
For further information write to the Continental Rubber Works, 2016 Liberty St., Erie 6, Pa., or use the Request Card at page 18. Circle No. 86.

Which picture looks like your streets?

cured with water
and tarp—after
1 year service



Cured with Velsicol
concrete curing compound
—after 8 years' service



The best concrete—all of the quality materials and labor can be wasted if it is not cured properly. Protect your investment by specifying Velsicol's concrete curing compound resins in your next bid or contract and be sure of lasting results! Velsicol concrete curing compound resins work better because they insure stable formulations—both pigmented and clear. They form a moisture-proof skin that makes freshly poured concrete cure with uniformly greater hardness on the bottom, center and surface of the concrete area. Surfaces cured with Velsicol concrete curing compounds present no problems for subsequent paint coatings. Greater strength, plus time and labor savings in application mean lower costs and taxpayers money saved.

WHERE VELSICOL CONCRETE CURES ARE USED—streets, highways, dams, bridges, buildings, etc.

Get the facts, without obligation—A Velsicol representative will be glad to relate our work to your product needs, without cost or obligation.

VELSICOL CHEMICAL CORPORATION

VELSICOL

330 East Grand Avenue, Chicago 11, Illinois

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 387



LOOK FOR THIS MAN

Your Velsicol representative . . . a qualified chemist who will help you make better products for less!

VELSICOL CHEMICAL CORPORATION

330 East Grand Avenue, Chicago 11, Illinois

Please send a sample for pilot plant use.

Please have a salesman call to discuss your concrete curing compounds.

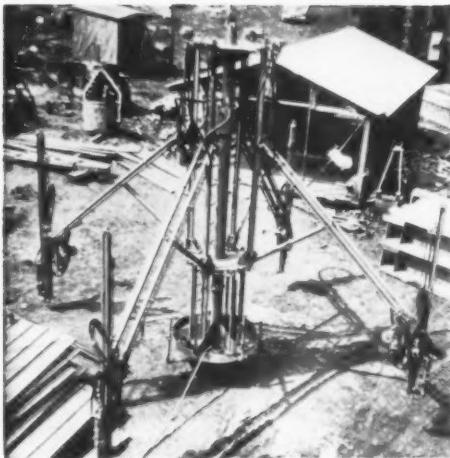
Please send technical literature.

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COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



The Le Roi SDR shaft sinker with air motor feeds and air-controlled booms is available with two, three, four, or six booms and a choice of six different drills.

Pneumatic shaft sinker drills faster and easier

A new shaft sinker with air motor feeds and air-controlled booms is available from the Le Roi Division of the Westinghouse Air Brake Co. With a choice of two, three, four, or six booms and six different drills, selection for specific needs is made easy, the company reports.

Available feeds include the DR40 with the standard 10-foot air motor feed and the DR34 with the standard 80-inch piston feed. Drills which can be used include the H10DR, the H12DR, and the H111DR—all 2½ inches in diameter; the 3½-inch H23DR; the 3½-inch D25DR; and

the 4-inch D14DR.

The SDR shaft sinker has a centralized oiling system and needs only one master air line from top-side, down the shaft, to the top of the shaft sinker. Air hoses to each drill are securely attached to the boom. Individual controls on each boom-end and drill are located according to customer specifications.

The maximum drilling area diameter is 26 feet when the arms are extended. The sinker closes to 11½ feet, but drills can be toed-in to drill next to the pedestal, which is 4 feet in diameter. Height of the SDR is 18½ feet.

For further information write to the Le Roi Division, Westinghouse Air Brake Co., 3716 W. Wisconsin Ave., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 125.

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THERE IS ONLY ONE Superkut CHISEL and it's made by



Specify VULCAN for:

PAVEMENT BREAKING TOOLS	PNEUMATIC HAMMER TOOLS
CLAY DIGGING TOOLS	ELECTRIC HAMMER TOOLS
DRILL STEELS	HAND TOOLS FOR CONCRETE, STONE, AND STEEL WORKERS



VULCAN TOOLS are sold by
distributors throughout the
United States and Canada

When Vulcan first introduced the Superkut Chisel to the market, it knew that this new tool could outperform any other comparable tool. However, not until it had been in the field for a short time did Vulcan fully realize the tremendous job this tool was capable of doing. Reports from users had nothing but the highest praise for the amazing performance of the Superkut.

Since that time "carbon copies" of the Vulcan Superkut Chisel have attempted to share the attention given this outstanding concrete breaking tool. To avoid confusion, always ask for the *Vulcan Superkut Chisel* when you want to break concrete into large pieces faster, easier, and at less cost than with any other tool. Equally suitable for breaking rock, asphalt, brick or cobblestone pavement.

When you specify Vulcan Superkut, you buy the original — not a "carbon copy."

VULCAN TOOL MANUFACTURING COMPANY

41 LIBERTY STREET, QUINCY 69, MASSACHUSETTS

Specialists in the Design and Production of Pneumatic Tool Accessories

For more facts, use Reader-Reply Card opposite page 18 and circle No. 388

BPR reports on progress of interstate program

Federal interstate funds totaling \$900 million have been obligated to projects, since the passage of the Federal-Aid Highway Act of 1956. According to the U. S. Bureau of Public Roads, these projects have a total estimated cost of nearly \$1.2 billion and provide for construction of 974 miles of highway. The total costs are almost equally divided between actual construction, \$547 million, and preliminary engineering and right-of-way acquisition, \$631 million.

Construction contracts awarded during the eight months since passage of the act have a total estimated cost of \$441 million. This includes \$363 million of Federal-Aid funds for construction of 791 miles of the interstate system.

42 HORSEPOWER

10 to 15 K.W. ELECTRICITY

DIESEL
REDUCES TIME LOST TO
POWER FAILURES

Built like a big engine, the Model 19 Sheppard masters the wear and tear of heavy-duty service with inherent diesel ruggedness. You pay heavily for work interruptions caused by light-duty engines on heavy-duty work. You can save most of that cost with a switch to Diesel. Write for Sheppard Model 19 engine or generating set data today.

**IT'S A CINCH
TO SWITCH TO
Sheppard**

**THE
SIMPLIFIED
DIESEL**

- LOW COST
- LOW WEIGHT
- COMPACT

**FITS INTO SAME SPACE
AS YOUR PRESENT ENGINE**

17" narrow • 32½" short
26" low • fan-to-flywheel

Engines and A.C. generating sets shipped from stock within 24 hours
SOLD AND SERVICED by more than 2,000 dealers

SHEPPARD DIESELS • HANOVER 44, PA.

Builders of Diesel Engines, Transmissions, Rear Axles & Power Steering Units for Industry

For more facts, use Reader-Reply Card opposite page 18 and circle No. 389

Engines and A.C. generating sets shipped from stock within 24 hours

SOLD AND SERVICED by more than 2,000 dealers

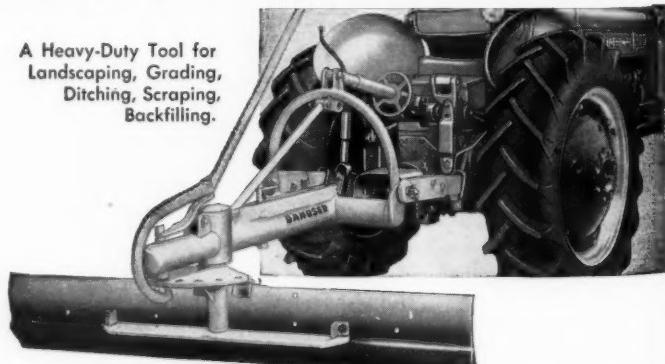
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Low-Cost Blade Makes Your Light Tractor an Efficient Earth Mover!

A Heavy-Duty Tool for
Landscaping, Grading,
Ditching, Scraping,
Backfilling.



One man can operate the DANUSER BLADE by himself and make adjustments without leaving the tractor seat. Blade uses the tractor three-point suspension principle, with adapter kits available for older models. It is raised and lowered by the tractor's hydraulic system, and turns all the way around so you can push with it.

Rugged construction throughout. Built of reinforced welded structural steel and heavy tubular members. Abrasion-resistant moldboard

with replaceable, standard grader cutting edge. Moldboard mounting is supported on two oversize tapered bearings to maintain stability. It shifts 8 inches right or left of center for cutting beyond tractor wheel line.

Danuser built the original rear-mounted blade, and is still producing the finest tool of its kind on the market. Thousands are in daily use throughout the world. Tested and approved by tractor manufacturers.

"Quality Since 1910"

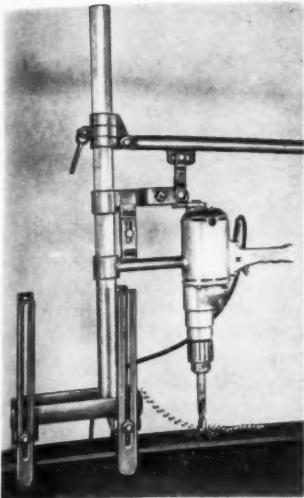
DANUSER MACHINE CO.

535-39 East 3rd Street

Fulton, Missouri

For more facts, use Reader-Reply Card opposite page 18 and circle No. 390

CONTRACTORS AND ENGINEERS



Most standard drills fit portable radial press

A portable radial drill press that will handle most standard heavy-duty portable drills—both electric and air-powered—and will operate in all positions is available from the Lance Iron Works. According to the manufacturer, the unit clamps and rolls freely on any size, shape, or type of metal or wood.

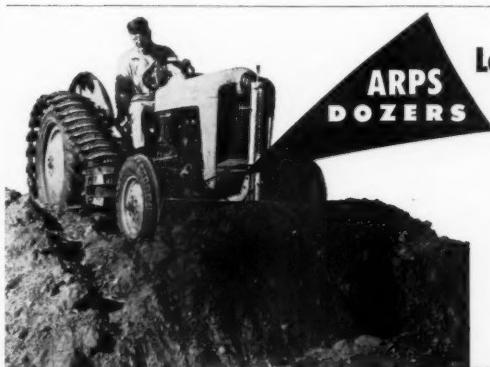
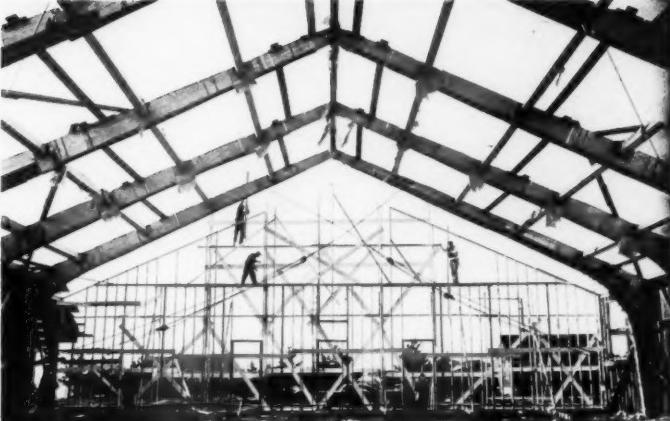
The Model 1007 is adjustable to 14 inches horizontally. Larger models are available for special jobs. The unit can be carried, set up, and operated by one man.

For further information write to the Lance Iron Works, Box 310R3, Chicago Heights, Ill., or use the Request Card at page 18. Circle No. 92.

Koppers appoints E. Rose

The Freyn Department, Engineering & Construction Division, Koppers Co., Inc., Pittsburgh, Pa., has appointed E. Herbert Rose chief beneficiary engineer. Rose will make his headquarters in the home office.

GRANDSTANDS MEASURING 280 FEET LONG and seating 5,000 persons, for the Biscayne Kennel Club, Miami, Fla., were completed in five months by the Ludman Steel Co., Miami. The firm used 194 tons of Junior Beams, lightweight steel structures made by Jones & Laughlin Steel Corp., Pittsburgh, Pa., to support the flooring on all three levels of the grandstands, as well as for the rake beams for the tiers of seats. The contractor erected the 940 tons of steel for the grandstands in less than 30 working days.



Low Cost—Big Yardage—Versatile ARPS Dozer

- Quick, Easy Installation
- Double-Acting Hydraulic Control
- Wide Range of Blade Positions
- Positive Down Pressure

Here's the low cost, rugged dozer attachment that can't be beat for removing top soil, leveling, grading, snow plowing, backfilling, landscaping and many other earthmoving applications. Blades supplied in 4', 5' and 6' lengths for every need. Dozens of exclusive features help you do a better job with low initial investment.



Handy ARPS Utility Blade

- Strong, Tubular Frame
- Blade Tilts, Offsets, Angles, Reverses
- Blade Adjustments Made Without Wrench
- Heavy Duty and Standard Duty Models

This handy unit will convert any 3-point hitch tractor to a versatile tool for ditching, terracing, grading, landscaping, backfilling, land leveling, road building and snow removal. Tilts up or down 35°—has five positions. Nine angular positions forward and three in reverse. Offsets to the right or left with eight blade pitch adjustments. Rotates full 360°—can be fully reversed for backfilling. Gauge wheel for precise finishing.

See your tractor dealer for the full story on Arps Dozers and Utility Blades, or write for literature and prices.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 391

**For better performance and longer service
get protective maintenance done *On time!***



Hobbs ENGINE HOUR METERS TAKE AWAY THE GUESSWORK

Beat down-time through timely maintenance . . . know WHEN lubrication, oil change, overhaul, etc., are due. Today's engineers recommend maintenance in terms of operating time instead of distance . . . the Hobbs Engine Hour Meter provides that information. Not a revolution counter, but a true electric timing instrument recording HOURS and MINUTES. Ruggedly built . . . simple to install . . . easy to read. For both gasoline and diesel engines. Approved and recommended by leading manufacturers. See your factory branch, representative, distributor . . . or WRITE:



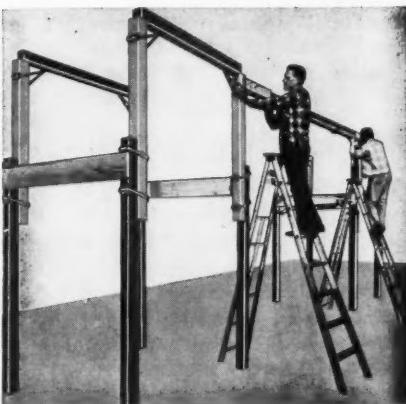
JOHN W. Hobbs CORPORATION A DIVISION OF STEWART SW WARNER
2067 YALE BLVD. SPRINGFIELD, ILLINOIS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 392

USE ELLIS HIGH-SPEED METHODS

For Suspended Reinforced Concrete Forming Jobs!

THE NEW 5' U-PURLIN ASSEMBLY goes up quickly to make a corner or end unit of shores-with-purlin. Easily assembled on the ground and erected in the inverted U position, two 5' U-Purlin assemblies can be joined with a horizontal brace, as shown in the photo, since Ellis Shores can be nailed at any point. With a similar unit at the other end of the line, purlins with slip-in shore-holders attached can be added between (seated on ledges and cleated) to form a line of desired length. Since slip-in shores can be used under all of the in-between purlins, tremendous savings of time and labor are assured!



Mail coupon at right or write for free suggestions on your structural plans to—

Ellis

MFG. CO., INC.
211 N. W. 4th St., OKLAHOMA CITY, OKLA.

Send me more information at no obligation.

Name _____

Address _____

City _____ State _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 393



Portable hoist raises load 80 feet in minute

A portable hoist, that will raise loose and bulk construction materials as high as 80 feet in one minute and drop down for a new load in less than 20 seconds, is available from the Campbell Equipment Co. The Lad-E-Vator has a capacity of 1,000 pounds when it is used at its maximum length.

The hoist consists of aluminum track sections topped with a curved tongue section. The unit operates with a 4½ or 7-cubic-foot dumping scoop for use with concrete, three sizes of wheelbarrow platforms, and a 36×24-inch platform with a 36×36-inch back. Power is supplied by a 4 or 6-hp gasoline engine or a 3-hp electric motor. The power plant is connected directly to the winch, which is of worm gear design, running in oil.

Available for use with the Lad-E-Vator hoist is the Trail-Erector trailer unit. The hoist is permanently attached to the towing rig, which rides on a pair of pneumatic tires. The unit has a welded frame of tubular and angular steel.

For further information write to the Campbell Equipment Co., 2122 N. Menard Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 88.

United Steel Fabricators elects board officers

United Steel Fabricators, Inc., Wooster, Ohio, has elected Ceylon E. Hudson chairman of the board of directors. Hudson was previously vice president and treasurer of the company. Walter A. Locker, who has held the offices of secretary and assistant treasurer, was named president.

The board of directors has established three new corporate offices. Carl E. Mathis was named vice president and assistant to the president; Charles C. Hall, vice president in charge of sales; and Thomas W. Henderson, vice president in charge of engineering. Newly elected treasurer and assistant secretary is Joseph S. Keefe.

Ernest S. Infield has been named sales manager of the firm's Highway Products Sales Division.

A Lad-E-Vator's 7-cubic-foot scoop swings over the curved top of its tower to dump a load of concrete on a Spokane, Wash., job.

Portable concrete mixer described in literature

A bulletin describing the Model 3½-S Dandie Junior concrete mixer is available from the Kwik-Mix Co., a division of the Koehring Co. The mixer has a capacity rating of 3½ cubic feet of mixed material, plus a 10 per cent overload.

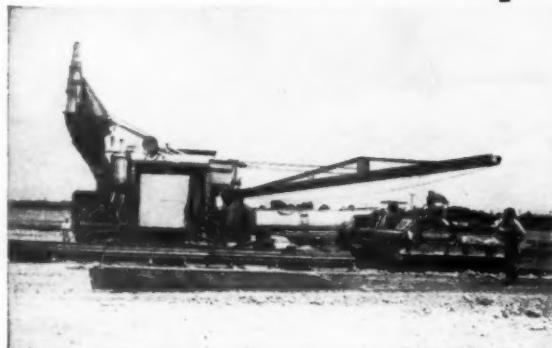
The catalog outlines some of the structural and operational features of the Dandie Junior. The rig is powered by a 2.2-hp air-cooled gasoline engine, or an optional electrical motor, with single V-belt power transmission. The all-welded steel drum is equipped with four improved mixing

blades and a replaceable ring gear. The 18-inch drum opening and 4½-inch charging height provide fast, easy loading, the company reports.

The frame, mixing drum, and yoke are of all-welded box-section steel. Anti-friction bearings are used throughout. A hand-controlled tilting device is slotted to hold the drum in any desired position.

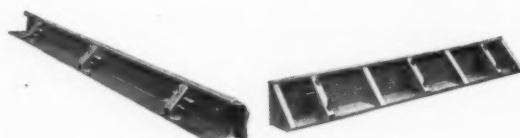
To obtain Form No. KM-494 write to the Kwik-Mix Co., 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 111.

Here's the only Complete Concrete Paving Line with Experience



Blaw-Knox MultiFoote Paver gives you faster, more complete Mixing

The exclusive cone-shaped drums of the MultiFoot Pavers assure you of thorough mixing in a shorter time or more complete mixing in a specified time than you could get in an ordinary paver with the common cylindrical-shaped drum. The natural end-to-end motion of the aggregate, cement and water produced by the cone drum results in a folding action that completely turns the batches over and over to assure the most thorough mixing in the shortest possible time. With this more thorough mixing and the faster skip operation of the MultiFoote, hydraulic controls and the automatic cycle you can be sure the MultiFoote Paver will give you more batches per hour. If you are planning concrete paving work be sure to see your Blaw-Knox MultiFoote distributor to get all the facts about these high capacity units.



Self-Aligning Road and Airport Forms

Setting Blaw-Knox Self-Aligning Paving Forms true to line and grade is a cinch. Look at all the features that save time and money. Double-wedge staking system prevents tipping of forms by crooked stakes. One-piece lock-joint end slides give you fast aligned joints. Buttress-type stake pockets together with over-all sturdy construction of the forms prevent mis-alignment. Road forms are available in heights of 6" or more and Airport forms in heights of 12" or more.

depend on the
BLAW-KNOX
"Complete Package"
for maximum pro-



Dependable Blaw-Knox Finisher

Team-up a Blaw-Knox two-screed Finishing Machine with a Blaw-Knox Spreader and you will be sure of turning out highest finish from harsh, dry concrete. Easily widths and choice of traction and screed adapt Finisher to fit any paving job.



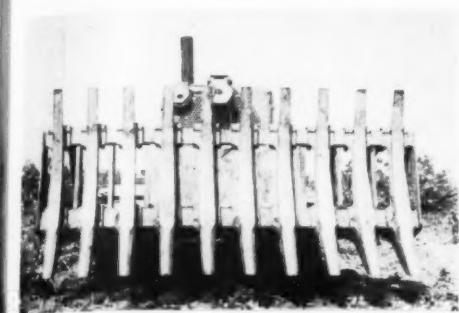
Blaw-Knox Precision Subgrader

Here's the only Subgrader that excavates vibration — cutting through even the heaviest subgrade to produce a perfect grade in crown and cross-section. Fast and accurate produces more work with less power at a cost per square yard to assure accurate control of slab thickness to save concrete.

Fast Accurate Batching Plants

Blaw-Knox Aggregate and Cement Bins and Batching equipment are available to match the high capacity of all units in the Blaw-Knox Complete Package of Concrete Paving Equipment. Both Cement and Aggregate Batching Equipment are available with manual, push-button air-operated or automatic controls.





The Fleco D9 rake for Cat D9 straight or angling dozers permits the varying of the number of teeth to be used and of the spacing between the teeth.

New rake attachment fits straight, angling dozers

■ The Fleco D9 rake, available for straight and angling dozers on Cat D9 tractors, has specially designed teeth and frame to give strength and withstand severe shocks and heavy loads, according to the Fleco Corp. The rake uses the same C-frame or push arms as an angle or straight dozer

and is easily interchangeable with the dozer, the company reports.

The rake features a design which permits multiple spacing of the teeth to match the clearing conditions and types of materials. This permits from five to ten teeth with equal spacing.

The frame includes two heavy

boxed angle sections with heavy end gussets and intermediate gussets behind each tooth for strength and rigidity. The teeth are heat-treated manganese steel castings that weigh 560 pounds each.

The overall length of the angle rake is 14½ feet. The straight rake is 13½ feet long. Raking width varies between 12½ feet and 11 feet, depending upon the number of teeth used.

For further information write to the Fleco Corp., P. O. Box 2370, Jacksonville, Fla., or use the Request Card at page 18. Circle No. 132.

New masonry saw does work of five tools

■ A new 2-hp masonry saw that is able to do the work of five different



With the Clipper Supermatic masonry saw, the only operation required to raise or lower the Sta-Level cutting head is a few turns of the Hi-Lo control wheel.

cutting tools is announced by the Clipper Mfg. Co. The Clipper Supermatic saw can operate as a wet or dry masonry saw, a light-duty concrete saw, and a track saw. Frame extensions can be added to increase the saw width up to 6 feet to cut sills, copings, and large stone and masonry.

According to the company, a few turns of the Hi-Lo control wheel quickly and automatically positions the Sta-Level cutting head.

For further information write to the Clipper Mfg. Co., 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 126.

Drilling and blasting

■ A brochure outlining current information on drilling, blasting, and excavating methods used by the construction and quarrying industries is available from the American Cyanamid Co.

Entitled "Construction Case Histories", the bulletin unfolds into a three-page chart which presents 48 detailed construction case studies in condensed data form for rapid reading and reference. Information is classified under 26 headings of special interest to contractors.

Case studies include information on geological formations, excavating practices, drilling equipment, bit performance, drill patterns, blasting data, and explosive ratios. Also included is a pictorial plan view of blasting patterns used.

To obtain this brochure write to the American Cyanamid Co., Explosives Dept., 30 Rockefeller Plaza, New York 20, N. Y., or use the Request Card at page 18. Circle No. 123.

Concrete curing methods

■ "Curing and Protecting Concrete Highways" is the title of a booklet for engineers and contractors available from the American Sisalkraft Corp. The booklet shows the results of tests on various curing materials and explains why concrete curing is necessary. On-the-job photographs are used to show one curing method using reinforced white paper blankets manufactured by American Sisalkraft.

To obtain "Curing and Protecting Concrete Highways" write to the American Sisalkraft Corp., 55 Starkey Ave., Attleboro, Mass., or use the Request Card at page 18. Circle No. 113.



Only Blaw-Knox Concrete Spreaders spread with a Blade—the Natural Way!

Even the driest and harshest concrete is easily and naturally spread with the automatic transverse action of the spreading blade, shown in circle at left. This transverse motion of the spreading blade spreads concrete uniformly to elevation required and clears the path for forward motion of the spreader. Since there is a minimum of action on the concrete, there's no segregating effect regard-

less of its dryness or size of aggregates. Automatic reversing of the spreader blade relieves lateral pressure so alignment of forms is never disturbed. Blade can be set to automatically clear pre-installed center joint. A vibratory attachment that operates off the spreader power unit can be added that will assure maximum density without segregation even in dry, harsh concrete. Even with vibratory attachment only one operator is needed. Width easily adjusted to meet all paving requirements.

All "Complete Package" Paving Equipment Job-Proved

Blaw-Knox "Complete Package" Paving equipment has become the first choice of contractors throughout the country. Contractors with a spread of Blaw-Knox equipment know that they can depend on its many tested and proved design features plus

one distributor source for parts and service to keep their jobs on schedule. If you are planning to bid on concrete paving, plan to use the only line of equipment with experience—see your nearest Blaw-Knox Distributor today.

For more information on any of these units send for the following bulletins by number—MultiFoote, No. 2616; Road Forms, No. 2370; Finisher, No. 2517; Subgrader, No. 2227-R; Batch Plants, No. 2488; Spreader, No. 2485.



BLAW-KNOX COMPANY
Construction Equipment Division
40 Charleston Ave., Mattoon, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 394



The mile-long Jim Woodruff Dam, dedicated last month, has a 450-foot-long 82-foot-wide navigation lock, with maximum lift of 33 feet. The dam is built at the point where the Flint and Chattahoochee Rivers join to form the Apalachicola River in Florida.

Dedication ceremonies for Jim Woodruff Dam

Last month the \$46 million Jim Woodruff Dam in Chattahoochee, Fla., was dedicated, terminating a 10-year construction program by the joint-venture firms of Perini, Walsh, Mills & Blythe Bros., Chattahoochee. The mile-long dam has three 10,000-kw generators in the powerhouse, and a 450-foot long 82-foot wide navigation lock with a maximum lift of 33 feet.

Built at the point where the Flint and Chattahoochee Rivers join to form the Apalachicola River, the dam has a 37,500-acre man-made lake surrounded by 17,000 square miles of drainage area. The lake has a 9-foot channel linking inland ports with the Gulf of Mexico via the Apalachicola River, and can produce enough hydroelectric power to supply 76,000 families.

Rising waters in the dam will form a V-shaped body of water stretching 47 miles up the Flint River Valley into Georgia on the east side, and 52 miles up the Chattahoochee River valley along the border area shared by Alabama, Georgia, and Florida on the west side.

Along the 243-mile shoreline, industrialists anticipate an access route for raw materials and markets along the Gulf Coast and throughout the Mississippi River system. Bainbridge, Ga., located on the eastern arm of the lake, has already established Georgia's first inland port, and other cities in the tri-state area are making plans for similar installations.

Air hammer catalog

■ Information about the Ramec Model AR-4 air hammer, which features precision impact control, is contained in a catalog from E. V. Nielsen, Inc. Specifications for the 4½-pound air hammer, as well as specific applications, are included.

The Model AR-4 has full range control—from a light tap to a heavy blow—the manufacturer states. It is capable of delivering 5,400 blows per minute. Chrome-plated to prevent rust and corrosion, the air hammer features angled air release ports that beam a direct stream of air upon the point of work, keeping it clean.

More than 40 available tools and accessories for use with the Model AR-4 are illustrated and described.

To obtain Catalog No. AR-4C write to E. V. Nielsen, Inc., 129 Broad St., Stamford, Conn., or use the Request Card at page 18. Circle No. 116.

Catalog on redesigned concrete-truck body

■ A catalog, describing how the redesigned Model D Dumpcrete non-agitating concrete body can handle up to 4 cubic yards of concrete when mounted on a single-axle truck and up to 6 yards when mounted on a tandem-axle rig, is available from the Maxon Construction Co.

The nine important features of the Dumpcrete—including the 90-degree dumping angle, the dual body controls, the 18×22-inch gate opening, and the extra-wide paving chute—are

explained and illustrated. Details concerning the various accessories available are also given.

On-the-job photographs illustrate the various applications of the Dumpcrete. Full mounting information and complete specifications also are given.

To obtain this catalog write to the Maxon Construction Co., Manufacturing Div., 2600 Far Hills Ave., Dayton 9, Ohio, or use the Request Card that is bound in at page 18. Circle No. 122.

On any-size dirt job, anywhere... power-up profitably with Int'l



In the 200-acre Knollton Heights Subdivision, Hughey Construction Company, Indianapolis, stays ahead of the lot-grading with this TD-9 Four-In-One. Here, they're getting inch-close grading accuracy—boiling in dirt with Four-In-One "carry-type scraper" action! Excavating, loading, dozing, or clamshell action is instantly available with a Four-In-One!



"Our bread-and-butter machines are International Crawlers," says Perry Alexander, Jr., for Perry Alexander Construction Co., Asheville, N. C. "I just traded in a TD-18A, with 13,000 hours on its meter; used no oil between changes—and beat a competitive crawler in overall maintenance and track life." Picture shows their new TD-14 finish-grading around Asheville's new \$600,000 Doctor's Building.



See how the bonus-powered International TD-18, for example, helps speed construction of "decentralized" new factories. You get cleared-for-action deck, control-tower visibility and booster steering to cut lever-pull effort. You also get operating ease of engine clutch with long-lasting Cerametallic facings. Such exclusive feature combinations help operators increase daily production, substantially!

For your king-sized jobs, check these giant-sized advantages of the giant-powered TD-24. See how exclusive, time-proved Planet Power steering gives you full-time "live" power and traction on both tracks for positive, full-load steering, upgrade or down! Plus cycle-speeding on-the-go shifting—and instant, stall-preventing Hi-Lo shifting, without declutching!

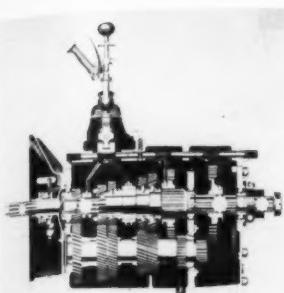
For dirt-moving versatility, International Drott® Four-In-One Skid-Shovels® give you huge performance and production advantages over anything else in the loader-excavator field! You get instant, fingertip availability of four big-capacity machine actions: famous Skid-Shovel dig-ability; scraper-like grade-or-spread ability; earth-rolling bulldozer; and load-gulping, high-dumping clamshell!

Along with the superhighways are other millions of cubic yards of "big-pay dirt" to be moved in plant, school, public building, shopping center, and housing developments. Prove to yourself the reasons why more and more contractors are using International crawlers as their power packages. See your International construction equipment distributor for a demonstration.

"One of our TD-24's—a 1951 model—ran 7,500 hours before major overhaul on rails and engine," states P. H. Morris, for Morris Enterprises, Owensboro, Ky. "It's still in use with original rollers and sprockets. That sold me on TD-24's for my operation!" This Morris-owned TD-24 moves 50% of the 45-foot earth-shale-soapstone overburden, ahead of the 3½-yard dragline.

Industry comes to Market Arkansas—(population 3,000) a modern shirt factory rises on market locally-subscribed to create jobs. local contractor, St. Francis Construction Co., gets a profit 8,000-yd fill-spreading job done time with their hydraulic equipped TD-18!

A COMPLETE Scarpers ... and Carburetors



The Roadranger R-35 transmission has seven forward speeds and one reverse, all shifted by a single lever.

Seven-speed transmission shifted by single lever

■ A new seven-speed transmission in which all speeds, both forward and reverse, are shifted by a single lever is announced by the Fuller Mfg. Co. The Roadranger Model R-35 is designed for gasoline engines of up to 400 cubic inches of piston displacement.

With the R-35, the company reports, shifts are short, simple, and

fast. The operator has seven speeds available in progressive and selective steps, with closely spaced and equal ratios in the operating range. The R-35 is a unit-mounted transmission without an auxiliary section.

The R-35 permits the engine to work in its peak horsepower range with greater fuel economy, according to the company. There is $\frac{1}{3}$ less shifting, which reduces driver fatigue. Skip-shifting is permissible.

For further information write to the Fuller Mfg. Co., Transmission Division, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 129.

Traffic barricade uses kerosene warning lights

■ A traffic barricade with retractable kerosene-burning flares that will operate for 64 hours without refueling is available from Traffic Safety Equipment Co., Inc. The Twin Flare barricade is of all-metal construction and consists of a cross-section, which also serves as a fuel tank, and two pairs of legs.



The Twin Flare traffic barricade is equipped with two kerosene-burning flares that will operate for 64 hours without refueling.

During the day, red warning flags are used on either end of the fuel tank-cross bar. At night, the spring-loaded leakproof burners are lit. When not in use, the burners are retracted into the fuel tank and held in place by the snuffer caps, which fit flush with the top of the cross bar.

The cross bar measures $60 \times 6 \times 3\frac{1}{2}$ inches, and will hold five gallons of fuel. The legs are made of $\frac{1}{2}$ -inch galvanized pipe, with a 30-inch extension to permit height adjustment.

For further information write to the Traffic Safety Equipment Co., Inc., 415 S. Cicero Ave., Chicago 44, Ill., or use the Request Card at page 18. Circle No. 127.

Data on scalping plants

■ Portable intermediate scalping plants that provide intermediate crushing and scalp of unwanted fines and dirt are illustrated and described in a bulletin from the Iowa Mfg. Co. The bulletin explains how these plants are designed to fit between portable primary crushing plants and portable secondary crushing and screening plants to increase both crushing and screening capacity and to remove fines to provide a high percentage of crushed material.

The versatile plants can be used for primary crushing in gravel pits where the oversize is not too large, arranged in closed circuit with a screening plant to handle the entire crushing operation, and set to remove one size of product.

The bulletin describes five models available with three different crushers: the twin-jaw crusher, the roll crusher, and the Symons cone crusher. Except for the latter, all parts are manufactured by the Iowa firm.

To obtain Bulletin Unit 4 write to the Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa, or use the Request Card that is bound in at page 18. Circle No. 121.

← For more facts, circle No. 395

...contractors with International!



INTERNATIONAL CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



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Benton County engineer Jos. D. Kotsmith is seated at his desk in the new modern office building.



Two Caterpillar No. 12 motor graders back out of their stalls, which are part of the new office, shop, and warehouse building of the Benton County Highway Department. The left part of the building houses the offices of the county engineer and his staff.

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eliminate manual digging



IN EXCAVATING FOR...

CAISSON PIERS • CONCRETE PILES • TANK BURIAL • CESSPOOLS
SOIL TESTS • MINING • WATER WELLS • OIL WELLS • MANHOLES

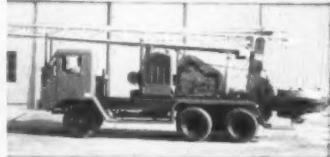
THE BUCKET ROTATES on a CALWELD Earth Drill and bores down into the earth. When the bucket is full it is pulled up and dumped. That's how easy it is to make a clean excavation of any size from 1 to 10 feet in diameter and as deep as 200 feet.

The excavation goes fast, too, because it removes up to 1.4 yards per pass; can dig a hole 45 feet deep in less than one hour. Thus, the CALWELD Earth Drill eliminates slow, costly hand labor and danger to workers.

There is a variety of interchangeable buckets available for digging in all types of subsoil formations.

Hundreds of CALWELDS are being used by contractors throughout the World. Investigate the many, money-saving advantages of this high-speed excavator. Write for catalog. CALWELD, INC., 7222 E. Slauson Avenue, Los Angeles, Calif.

DIGS 12" TO 120" HOLES
AS DEEP AS 200 FEET
MOBILE • MANEUVERABLE



CALWELD
BUCKET TYPE
EARTH DRILLS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 396

180

Modern building houses county

One of the newest and most modern of county shops is that built recently at Foley, Minn. The new building contains the offices of county engineer Jos. D. Kotsmith and his staff, repair shops, and garages for maintaining and housing county road equipment.

The \$97,000 shop, containing more than 12,000 square feet of floor area, is of concrete tilt-up construction with some brick and concrete block walls. Designed by Louis Pinault of St. Cloud, Minn., it meets all the standards of the Board of Health, Industrial Commission, and fire marshal of the state.

In one corner of the structure are the offices, drafting room, vault, and conference room which are headquarters of the Benton County Highway Department. An adjacent 27x48-foot shop is for repairing equipment. This section, which has a higher roof than

the rest of the building, has an overhead traveling crane for lifting heavy equipment parts. The large entrance door to this section will admit, without dismantling, practically any piece of equipment used by the department. Smaller rooms off the main shop hold oil, tools, and parts. There is also a small blacksmith shop and a shop for repairing and refinishing signs.

Another room contains a Kewanee automatic oil-burning boiler operated by Minneapolis-Honeywell controls. The boiler, which burns No. 2 fuel oil, is supplied from the same diesel fuel tank used for motor graders and other equipment.

Equipment storage garage

Nine large stalls in the storage garage provide space for motor graders, trucks, and other equipment. Diesel fuel service is available to eight of the stalls. The fuel, stored in an



Cut backfill time 60% . . . with NEW POWER-PACK CONVEYOR

This low cost Power-Pack Conveyor provides a fast, labor-saving method for backfilling trenches, curbs and placing aggregate around drain tile. Power-Pack delivers smooth, uniform quantities.

Up to 700 tons of material per day can be handled using only one operator. Belt speed and discharge deflector are adjustable. The conveyor design also permits delivery of material up to 8 feet beyond truck and at heights up to 3 feet.

The POWER-PACK Conveyor can pay for itself on a single job.



Write for name of local distributor and Catalog H-56 with price sheets. Photograph album and testimonials available on request.

U.S. PAT. NO. 2,779,508

POWER-PACK CONVEYOR COMPANY
13910 ASPENWALL AVE. CLEVELAND 10, OHIO
26 Years in the Conveyor Industry

For more facts, use Reader-Reply Card opposite page 18 and circle No. 397

CONTRACTORS AND ENGINEERS

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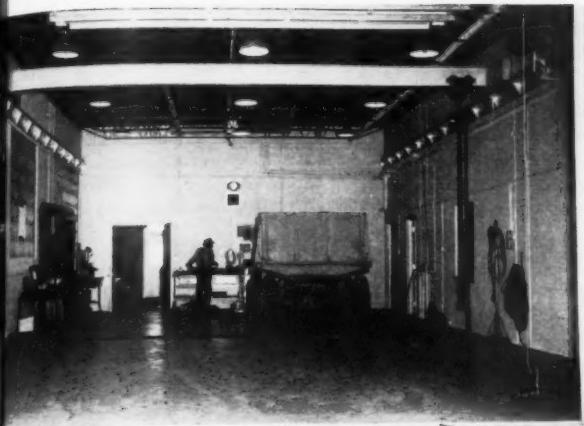
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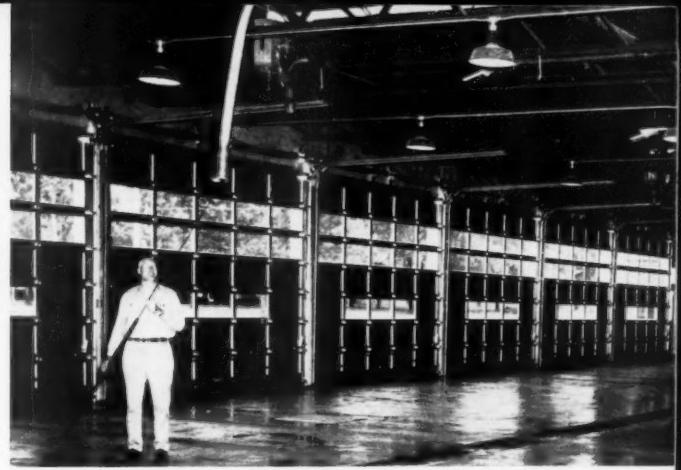
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The stalls in the garage have an Ammerman No. 350 overhead disappearing system for removing exhaust fumes. Here Mr. Kotsmith pulls down one of the exhaust tubes out of the ceiling receptacles. The tube is placed over the engine's exhaust pipe, and a roof fan pulls the gases outside.



The high door on the equipment maintenance shop permits one of the eight dump trucks owned by the county to enter the shop easily. The overhead traveling crane, at right, lifts heavy equipment parts to any point in the shop.

Benton County highway shops

outdoor underground 4,000-gallon capacity tank, is pumped into four pits in the garage floor, each of which serves two stalls. Gasoline service is from a pump located in the yard away from the building.

Each stall of the storage garage is fitted with a No. 350 overhead disappearing exhaust system to remove fumes and gases from engines which are started or kept running inside the building. The system is manufactured by C. L. Ammerman Co., Minneapolis, Minn. A long flexible tube, pulled down from a receptacle in the ceiling, is placed over the exhaust pipe of the engine, and a roof fan pulls the exhaust gases outside.

Each of the stalls in this garage has its own overhead door so that the equipment in any stall can be taken in or out of the garage without the need for other machines to be moved.

At the far end of the storage

garage, completely isolated from the rest of the building, is a paint shop with explosion-proof electrical fixtures and motors, which guard against possible fires when equipment is being spray-painted. At one end of the paint room is a Paasche paint spray booth equipped with paint arrestors made by Research Products Corp., Madison, Wis. In this booth, signs, parts, and small pieces of equipment can be spray-painted.

Important facilities for the men who work for the Benton County Highway Department are the shower, locker, and lunch rooms. The lunch room has an automatic electric coffee pot, a hot plate, electric refrigerator and sink. During cold weather, when the crews are sanding or plowing snow, these warm and dry rooms are appreciated.

Most of the local roads in Benton
(Concluded on next page)

For every size job
For every type
equipment

MARTIN Trailers

**make money
on every move:**



"Martin Folding Gooseneck saves 2 hours on every move" ... Equipment Inc., Wichita, Kan.

A dumper is a big, awkward, top-heavy machine to move. Before this progressive firm, Equipment Inc., bought a Martin Folding Gooseneck, it took hours to build a safe ramp and load this dumper. Now, Manager Duane Swartz tells in his own words of their savings: "The dumper is our main piece of machinery that is hard to load. We save about 2 hours on every move with the Martin Folding Gooseneck Trailer. We also haul other equipment such as a heavy tractor and scraper unit, or a 16' 6" high concrete plant. It works very well and we like it very much."

What about you? Do you sweat out every loading job — hoping that a block won't slip and tip your machine over — risking your life by taking a chance — wasting hours of time you should be producing instead of building ramps and loading?

Then this Martin Folding Gooseneck is a wise choice for you! See it at your Martin-Caterpillar Dealer! And remember — there's a big difference among movable gooseneck trailers — only Martin has the 100% successful one — the Folding Gooseneck Trailer!

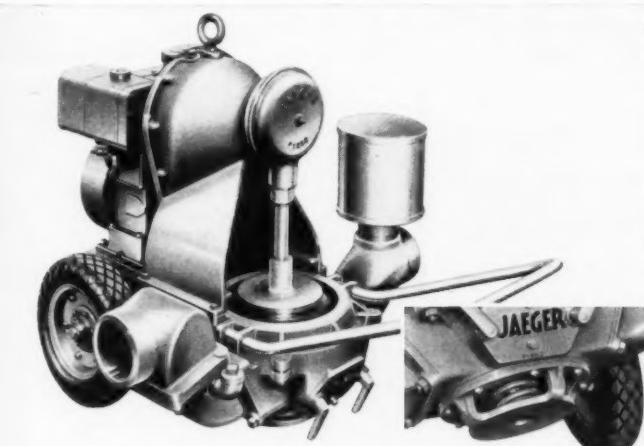
MARTIN MACHINE COMPANY, Kewanee, Illinois
MARTIN PACIFIC TRAILERS INC., Pomona, Calif.



Dumper climbs aboard Folding Gooseneck Trailer on its own power — ready to roll in minutes!



MARTIN Trailers



New Jaeger Diaphragm Pump

(1) Unique *spring-bottom* bowl prevents build-up of clay or cement deposits and protects from shock if stones enter pump. (2) Light, free-swinging valves give minimum resistance and quick, tight closure. (3) Surge chamber eliminates "kick", doubles hose life. (4) Quick diaphragm change — loosen 4 bolts and tilt back. 4" model pumps up to 7000 gph at 10' lift, 4000 gph at 25'. Also built in 3" size. See your Jaeger distributor or write.

The Jaeger Machine Company, 701 Dublin Ave., Columbus 16, Ohio
AIR COMPRESSORS • CONCRETE MIXERS • PAVING MACHINES

For more facts, circle No. 398

For more facts, circle No. 399

(Continued from preceding page)

County are on the County System, although four state highways cross it. The county road system is divided into two classifications—the State Aid System, consisting of 200 miles of roads, and the County Aid System, totaling 239 miles. Of this, 94 miles are bituminous or concrete pavements, and the remainder are gravel roads.

Although this is the fourth smallest county in the state, it ranks second in mileage of roads per square mile of taxable land.

To maintain this road system the County has 26 steady year-around employees and about 10 summer extras. These men use a sizeable fleet of equipment—seven Caterpillar No. 12 motor graders, two F W D and Walter 5 to 6-ton trucks, 8 dump trucks, a Littleford asphalt distributor, a John Bean 450-gallon spray for weed control, and 5 tractor-mowers. Extra equipment for the motor graders includes a Domore elevating grader attachment and a rotary wing attachment for snow removal. In addition there are several cars and pickups and a number of pieces of smaller equipment.

These crews, which handle the county highway maintenance, are under the supervision of maintenance superintendent Paul P. Esser, who works directly under county engineer Kotsmith.

THE END

HRB bulletin treats ground freezing causes

"Factors Influencing Ground Freezing", Highway Research Board Bulletin 135, presents papers on the fundamental processes of freezing and thawing and the way to solve the practical problems associated with frost action in soils. One of the seven papers presented in the bulletin discusses test data showing the relative effectiveness of 39 different additives in 15 different soils in an attempt to improve their resistance to freezing and thawing. Two papers compare the effect of freezing on reducing the load-bearing capacity of 34 New Jersey soils, and give the data on subsurface moisture contents and temperatures for six of the soils.

The fourth paper is a progress report of work being done in Canada. The fifth paper records the relative effectiveness of more than 50 New Jersey winters as producers of potential detrimental soil freezing. The factors determining the penetration of below-freezing temperatures into the ground, and a method for computing the maximum depth of frost penetration below highway and airfield pavements are analyzed in the sixth paper. The last paper discusses the fundamental concepts and theories of soil freezing and thawing.

Graphs, charts, tables, formulas, and job photos supplement all written data.

Priced at \$3.40, the bulletin may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Petro-engineering device

■ A booklet describing a new comprehensive cost-free service providing practical assistance on problems involving fuels, lubricants, and other petroleum products is available from the Gulf Oil Corp. The goal of the Gulf Petro-Engineering Service is to bring the company's engineering and research facilities closer to the problems relating to the use of the different petroleum products in such fields as construction and quarrying.

According to the company, the new service is valuable because of the highly specialized knowledge and experience that are required for application of many types of petroleum products in modern operations, and because of the advances that have

been made in petroleum science during recent years, particularly in the manufacture and application of lubricants.

The booklet gives detailed answers to such questions about the Gulf Petro-Engineering Service as what is it, why is it needed, who can get it, who makes the service call, how long does it take to get it, and what problems can it help solve.

To obtain this booklet write to the Gulf Oil Corp., 1822 Gulf Building, Pittsburgh 30, Pa., or use the Request Card that is bound in at page 18. Circle No. 118.

Non-shrink mortar

■ How to get better results in a dozen important construction operations by

using non-shrink mortar is discussed in a bulletin from The Master Builders Co. The operations are illustrated in a building cross-section view, and cover such applications as waterproofing walls and joints, grouting building columns, calking sewer pipe joints, patching defects in concrete, and setting floor brick and quarry tile.

Each application is keyed to an explanatory paragraph which cites other company literature giving detailed data on the use of non-shrink Embeco for any one particular application.

To obtain this bulletin write to the Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio, or use the Request Card that is bound in at page 18. Circle No. 119.

KANSAS TURNPIKE Self-widener purchased for use on Kansas City, Missouri, Freeway interchanges—built in flexibility made use on Kansas Turnpike equally profitable.



Again Flex-Plane has the nation's number one finisher

For the past three years, contractors have bought more Flex-Planes than all other makes — They will again in 1957... here's why

From the moment the FLEX-PLANE finisher was introduced it has been the favorite of the nation's highway builders. For the past three years it has been in a class by itself—the most versatile, most flexible, most portable and least expensive to operate of any machine on forms.

Now, for 1957, the FLEX-PLANE finisher is even better! It ever! Inher

INDIANA TURNPIKE More miles of Indiana Turnpike were finished with Flex-Plane machines than any other.



NEW JERSEY TURNPIKE Holland Tunnel cutoff had many sections. Self-widening feature aid



is discussed
Master Builders
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and quarry

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rite to the
Euclid Ave.,
the Request
at page 18.



The American Standard Model 600Z conveyor has a side ejection feature which guards the pulleys from accumulated seepage material below the belt.

Belt conveyor features side residue ejection

A belt conveyor designed so that residue materials, which might accumulate under the belt and affect

the pulleys, are ejected to the side is available from the American Planter Co. The Model 600Z Ameri-

can Standard conveyor is recommended for handling sand and gravel.

The conveyor is available in 6 and 12-inch widths. It is sectionally made in multiples of 4 and 8 feet in aluminum or galvanized steel with cleated rubber or steel mesh belts. The steel mesh belt is designed to permit sifting, and screening and washing operations.

Accessories which are available include an end hopper, dolly wheels, and two different chassis with rubber-tire running gear. Power is supplied by an electric motor or gasoline engine.

For further information write to the American Planter Co., Burr Oak, Mich., or use the Request Card that is bound in at page 18 of this issue. Circle No. 139.

cut costs

with

POLYFON.

A NEW CONCRETE ADDITIVE THAT:

- reduces water requirements by 4-6 gallons per cubic yard.
- lowers cement content as much as 10%.
- improves workability and strength.

There are no sugars in POLYFON T. Retarding effect, and chemicals usually added to overcome it, are therefore minimized.

As little as 0.05-0.1% POLYFON T based on cement weight, or 1-2 pounds for every 20 bags, does the job.

POLYFON T is a sodium lignosulfonate derived from abundant, low-cost kraft lignin. It is quality-controlled to assure maximum purity.

Send for bulletin 301 and samples for testing.

Polychemicals
DIVISION

West Virginia Pulp
and Paper Company
CHARLESTON, W. VA.
SOUTH CAROLINA

For more facts, circle No. 401

The June issue

of

CONTRACTORS and ENGINEERS

will once again be built around the theme of "efficiency and economy" in construction operations. Because it will be so full of money-saving and money-making opportunities for contractors it presents a most unusual opportunity to advertisers. Space for reservations can be handled through May 6th in New York or at the advertising sales office nearest to you (See page 4).

Contractors and Engineers
magazine of modern construction

470 Fourth Avenue, New York 16, N. Y.

183

gether—or individually, for the negotiation of complicated interchange patterns involving variable width and short radius super elevated curves. But, more important, it is the only really proved self-widening machine available today. More than 60 units operating throughout the nation attest to this.

The FLEX-PLANE carries the largest screeds in the industry-delivering the most satisfactory finish possible. Exclusive butt joint screed design enables screed lengths to be changed faster, easier than ever before. It is completely portable—a flick of the finger and it, instantaneously, becomes its own trailer.

Why not let FLEX-PLANE put you in contact with a FLEX-PLANE user? Talk to him and we are sure you, too, will GO FLEX-PLANE IN 1957!



THE FLEXIBLE ROAD JOINT MACHINE COMPANY
500 THOMAS ROAD
WARREN, OHIO

281

For more facts, use Reader-Reply Card opposite page 18 and circle No. 400

Construction camera



Keeping up with drilling crews that sink 24-foot holes in solid rock at a rate of 4,000 feet per day, a Bucyrus-Erie 71-B shovel loads out blasted rock at Brownlee Dam, Idaho. Detroit diesel engines supply power for the shovel and the Ingersoll-Rand Gyro-Flo compressor delivering air to the three drills.



Subsurface trench compaction to a 39-inch width is done on an 8-mile stretch near Gallipolis, Ohio, by a Blaw-Knox DTR-552 dual-drum trench roller. Lifts of sand and gravel and a bituminous base will bring the 16-inch deep strip to roadway level so the pavement can be widened.

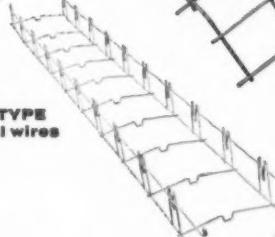
UNIVERSAL PRODUCTS for highway construction

DOWEL BASKET ASSEMBLIES

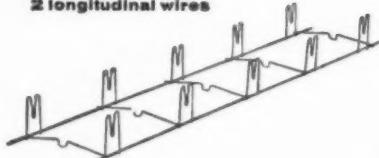
Universal Dowel Basket Assemblies are designed and fabricated to specifications. Special equipment and fixtures guarantee accurate spacing and positive alignment of dowels. High speed production equipment and modern facilities insure prompt delivery of your requirements. Universal Baskets are approved by Federal, State and private authorities for highway and airport construction.

*Let us quote on your requirements.
Write for complete details today.*

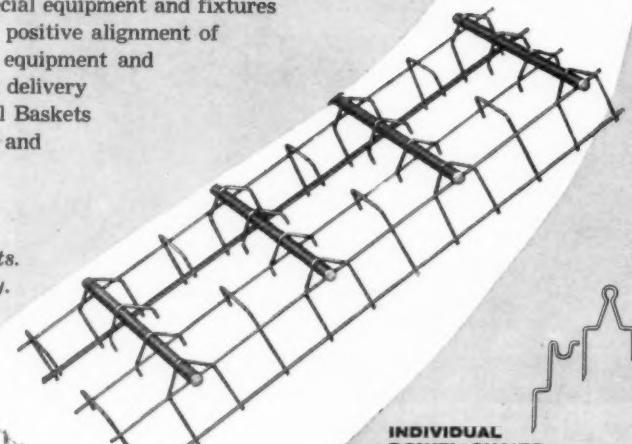
STANDARD TYPE
4 longitudinal wires



STANDARD TYPE
2 longitudinal wires



HEAVY DUTY TYPE
Maximum strength and support



INDIVIDUAL DOWEL CHAIRS

Two-legged dowel chair holds dowel in 2 positions. Easily pushed into sub-grade — won't turn after installation. Wide range of heights. Single Leg Dowel Chair permits quick snap-in of Dowel. Sizes to support Dowel from 3" to 6" above sub-grade.

STAKE PINS

Keep Dowel Bar Assemblies in place during the pour. Lengths from 4' to 15' in 1/4" increments.

DOWEL SLEEVES

Metal Dowel Sleeves for covering 3/4" Dowel Bars; overall length covers 2 1/2" or 3" Dowel. Special sizes and lengths available.

HOOK BOLT ASSEMBLY

For providing required rising element along longitudinal joint. Eliminates necessity of bending tie bars or drilling road forms.

Fla. turnpike awards toll system contracts to firms

Contracts amounting to more than \$325,000 have been awarded by the Florida State Turnpike Authority to the Remington Rand Division, Sperry Rand Corp., New York, N. Y., and to Taller & Cooper, Inc., Brooklyn, N. Y., for an integrated toll collection and auditing system. The system will be installed on the first section of the Sunshine State Parkway now under construction.

The system utilizes two basic types of equipment: Taller & Cooper field toll collection and recording devices located at each exit and entry point, and Remington Rand accounting and tabulating equipment located at the turnpike authority's offices. Both systems will control all toll collections and accounting for the parkway.

Clipper appoints four

The Clipper Mfg. Co., Kansas City, Mo., has appointed four field representatives. Tom Hubbard will represent

SAVE MONEY SEND US YOUR ORDERS FOR ROTARY SWEEPERS NEW BROOM CORES

Do You Know We Manufacture NEW Cores of the Following Types:

- Grace (3 types)
- Hough
- M-B (Meli-Blumberg)
- Detroit-Harvester
- Fordson
- and other popular makes

YES! We Can Make Cores to Your Specifications

We Rebuild—Repair—Replace All Makes and Sizes of Broom Cores.

Immediate Shipment

SUGGESTION—To Far-Away Users—Buy your NEW Cores only without any filling or we will furnish complete Palmyra-Hickory or Bass Fibers—Even Steel Wires.

Road Builders—It's Sensational! BIG PECKERWOOD BIG C-O-N-T-I-N-U-O-U-S Steel Wire Road Drag Leveler. Six (6) Inches Wide —Name Your Length

Not STAPLE set
In Stock Lengths of 4-6-8-10 or 12 foot
Only \$3.50 Foot "Approx. wt. 5 1/2 lbs. per ft."
NO FRAME REQUIRED

The LITTLE PECKERWOOD

3" Wide, 15" Length
This Fits Your Frame
NOTE—Both Drags Can Be Furnished with Fibre
Only \$2.50 Ea.

KENNEDY'S

Since VAN BRUSH MFG. CO., INC. 1928
327 Southwest Blvd., Kansas City, Mo.

For more facts, circle No. 403

CONTRACTORS AND ENGINEERS

R 1301
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SAN LEANDRO, CALIF., 2051-9 Williams St.
ATLANTA, GA., 1401 Howell Mill Rd.

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Wherever
You Build...Coast to Coast



For more facts, use Reader-Reply Card opposite page 18 and circle No. 402

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Huge rigs are dwarfed behind the upstream cofferdam at Bhakra Dam in India's Himalaya foothills. Part of a \$125 million project, the 680-foot-high dam, 1,700 feet across the top, will store water to generate a million kilowatts of electric power and irrigate 6½ million acres of land when completed in 1960. Unusual



among equipment on the job is a 3-mile conveyor bringing pit-run aggregate to a processing plant and 2 miles of conveyors delivering to the mixing plant, all supplied by Hewitt-Robins. The 1,700-foot-long H-R conveyor, above, has suspension span support along the mountainside.

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Airborne magnetometer surveys jungle for firms

Flying a Shoran-guided airplane, a magnetometer survey of 40,000 square kilometers of unmapped jungle in northern Guatemala got underway last month. Aero Service Corp., Philadelphia, Pa., is performing the survey for 15 oil companies.

The Shoran data will provide 200 control points as the network for ground surveys to establish oil companies' concession boundaries.

• FOUNDATION CONSTRUCTION
• CAISSENS SHAFTS DRILLED AND UNDERREAMED PIERs • SPECIAL DRILLING PROBLEMS
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Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C.
Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

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For more facts, circle No. 404

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A GOOD TEAM

H & L RAPID RIPPER

- Narrow sharp replaceable point penetrates in hard, compacted ground.
- Lightweight — Easy to handle — One man can attach or detach.

BULLDOZER CORNER ADAPTERS

- Increases efficiency of Bulldozer — More material moved with less power.
- Corner points stay sharp — Eliminates round corners.

FOR ALL BULLDOZER MODELS AND MODELS

H & L

TOOTH COMPANY
1540 SOUTH GREENWOOD AVE., MONTEBELLO, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 405

Construction camera



Sandy backfill material is picked up in the borrow pit by LeTourneau-Westinghouse Model C Tournapulls for use in building up approaches for grade separations at one end of the Mackinac Straits Bridge. Caterpillar D8 tractor-dozers are being used as pushers by the contractor, Johnson-Greene Co., Ann Arbor, Mich.



Important units in the fleet extending the yard of the N. C. & St. L. Railroad and the Louisville R.R. are this Euclid 15.5-yard scraper and Euclid TC-12 pusher. The grading job is being done by Onan Construction Co., Tenn., and Codell Construction Co., Ky.

HURMAN PORTABLE SCALES...

need NO concrete pits!

MOVE EASILY FROM JOB TO JOB — SET-UP IN MINUTES

CAPACITIES: 20 to 52 tons
DECK LENGTHS: 18 to 43 ft.

Other Thurman Scales: Pit • Warehouse • Industrial • Liquid Weighing • Wheelbarrow • Batching • Automatic

Precision Scales Since 1918

THURMAN SCALE COMPANY, 156 N. 5th STREET, DEPT. CO-3
COLUMBUS, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 406

Portable power to speed your jobs, cut costs!

UNIVERSAL LIGHTWEIGHT, HEAVY-DUTY ELECTRIC POWER AND LIGHT PLANTS

GASOLINE OR DIESEL models give you low-cost, instant power and light anywhere on the job . . . any place you go. End work delays, step up production. Hand carried, dolly mounted plus water cooled series up to 35 kw., gasoline and diesel . . . the industry's newest!

PRICED LOW—now see how little dependable Universal Electric Power and Light Plants cost. Mail coupon.

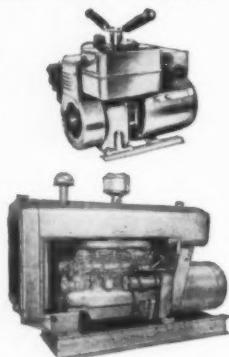
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ELECTRIC POWER AND LIGHT PLANTS
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641 Universal Drive, Oshkosh, Wis.
Send full details, prices on Universal Electric Power and Light Plants for construction work.

Name _____
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For more facts, use coupon or circle No. 407

186



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HURMAN

"Superior" Electric Carpellers



CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES

One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpellers are available for your specialized requirements.

"Carpellers for Easy Moving of Rolling Loads"
Write for New 24 page Bulletin C-616

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U.S.A.
New York Office, 7 Dey Street, New York 7, N.Y.

For more facts, circle No. 408

Corps of Engineers names eight district engineers

The U. S. Army Corps of Engineers has appointed eight new district engineers. Col. David G. Hammond will become district engineer at Omaha, Neb., succeeding Col. Thomas J. Hayes III; Col. Desloge Brown replaces Col. Otto J. Rohde at St. Paul, Minn.; Col. Carroll T. Newton succeeds Col. Arthur A. Frye, Jr., at Los Angeles, Calif.; and Col. Walter J. Wells takes over Col. Harry O. Fischer's job at Fort Worth, Texas.

Also appointed were Col. Edmund H. Lang for the U. S. Lake Survey, Detroit, Mich., succeeding Col. Edward J. Gallagher; Col. Lawrence E. Laurion to Kansas City, Mo., replacing Col. Ernest C. Adams; Col. William P. Jones to Memphis, Tenn., succeeding Col. Ellsworth B. Downing; and Col. Everett A. Hansen to Galveston, Texas, replacing Col. Willard P. McCrone.

All appointments are effective July 1957, with the exception of Col. Jones and Col. Hansen, who take over their positions in August.

New manganese teeth last twice as long

Specially designed manganese teeth that are said to have double the service life of regular manganese teeth are available from Industrial Overlay Metals, Inc. The Bergstrom Multi-Service teeth are ribbed to retard wear by exposing less frictional area. The ribs add from $\frac{1}{8}$ to $\frac{1}{2}$ inch of extra thickness starting at the base and graduating to the point.

Filling the grooves formed by the ribs with an abrasion-resistant electrode will increase the service life from three to four times, depending upon the alloy used and the length of the grooves filled. When sharp teeth are necessary, the grooves can be filled on one side to a thickness of from $\frac{3}{16}$ to $\frac{1}{4}$ inch with a high abrasion-resistant electrode. The unprotected manganese will wear at a faster rate, thus promoting self-sharpening.

For further information write to Industrial Overlay Metals, Inc., Eaton, Ohio, or use the Request Card at page 18. Circle No. 130.

CONTRACTORS AND ENGINEERS

APRIL, 1957

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Reader-Reply Card opposite page 18 and circle No. 409

APRIL, 1957



Blasted rock and earth are loaded into a timber crib cofferdam by a Manitowoc Model 3000 Speedcrane with a clamshell bucket. This work is for the single lift lock being constructed at Wilson Dam, east of Florence, Ala., on the Tennessee River, by the Tennessee Valley Authority and the U. S. Army Corps of Engineers.



Timber to be used for shoring is picked up by a Lorain 9-ton crawler crane with a 40-foot boom during work on the \$10½ million May Co. department store in University Heights, Ohio. Just behind the crane, a Caterpillar dozer teams up with a Euclid scraper to grade along the northern edge of the job site.

**PRESSTITE
No. 99***

**THE TOUGHEST,
MOST ECONOMICAL
SEALER AVAILABLE
for AIRFIELD
PAVING JOINTS**

■ Resists being BLASTED OUT
by terrific jet engine thrust.

■ Resists MELTING and BLOWOUT
from super-elevated temperatures from
jet after-burners.

■ Resists SHOCK and IMPACT
from heavy aircraft.

**■ Unaffected by jet
fuel spillage.**

**WRITE for
illustrated copy of
Bulletin 99**

**■ A Two-Component,
Cold-Applied Sealer**

**■ For Sealing Sawed
and Formed Joints**

**■ Meets
Federal Specification
SS-S-170,
23 May 1955**

Also Presstite No. 77
cold-applied non-JFR joint sealer.

*See this
Nubbin?*

it's the identifying
mark of
**MIL-CARB®
CARBURIZED
WASHERS**

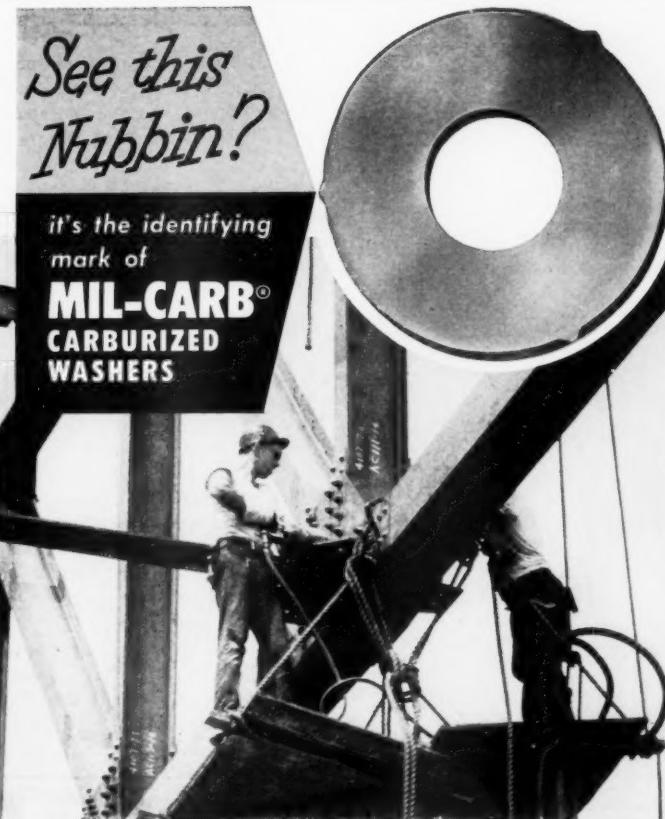


Photo courtesy Russell, Burdsall & Ward Bolt and Nut Co.

From an appearance standpoint, all washers, regardless of brands, practically look alike. But, there's a big difference in quality! That's why, for easy identification and to insure your getting the very best, Mil-Carb Carburized Washers are identified by 3 "nubbins" on the outside rim.

Mil-Carb washers are outstanding on at least three counts:

1. Only Prime Quality Special Soundness Steel is used for strength equaling or exceeding the rigid specifications of ASTM designation A-325 at all times!
2. A special treating process provides an exceptionally hard "outer skin" to resist grinding by the nut under the impact wrench when others fail!
3. MIL-CARB washers are always uniformly flat and smooth with dimensions conforming to the American Standards Association.

For your own protection and as a guarantee of the unyielding permanence of your steel structure . . . "look for the nubbin" . . . specify MIL-CARB Carburized Washers. Available in six sizes, from $\frac{5}{8}$ " to $1\frac{3}{8}$ ", packed in 200 lb. kegs.

Distributed by Leading Bolt and Nut Manufacturers and

U. S. STEEL SUPPLY DIVISION

UNITED STATES STEEL CORPORATION

208 South La Salle St. • Chicago 4, Illinois

**WROUGHT WASHER
MANUFACTURING CO.**
The World's Largest Producer of Washers
2118 S. BAY ST., MILWAUKEE 7, WIS.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 410

Construction camera



Runway and taxiway salvaging at Houston Airport is done by bituminous resurfacing over welded wire fabric reinforcing supplied by the Sheffield Division of Armco Steel. The Barber-Greene finisher carries an Igloo cooler of water for the crew. This job cost \$475,000 as compared with \$1,500,000 for new construction.



Wood ply forms used 35 times before work started on the \$355,000 educational building of the Westminster Presbyterian Church in Okla. City, Okla., are re-used five more times during the construction. Smiser Construction Co., Oklahoma City, had 4,200 square feet of Symons forms on the job.

The most...
\$8,700 per...
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feet from...

Clear • Cool Water



from IGLOO
all the time...
thanks to new
CRYSTALINING

Depend on water that is pure, taste free and cool from the new IGLOO water coolers that are more sanitary than ever.



Rely on these IGLOO features—

- Round inside bottom, easier to clean—more sanitary
- Complete CRYSTALINING inside cooler
- Recessed dripless spigot—won't be broken off
- 15% better insulation—no metal-to-metal contact at bottom means less heat transfer
- Best by test for rugged construction— withstands heavy bowling ball dropped repeatedly into bottom

D-57 ask your wholesaler or write



For more facts, circle No. 411

Pioneer founder dies

J. A. Hanratty, one of the five original founders of the Pioneer Engineering Works, Inc., Minneapolis, Minn., died February 26. Hanratty designed a portable crushing and screening plant incorporating the return cycle system. He retired from active work with Pioneer in 1953, but continued as a consultant.

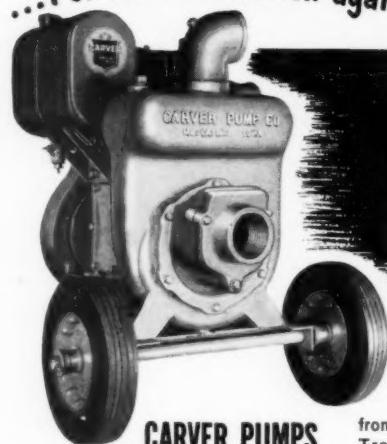
Signs, signals, markers

A catalog from Grote Mfg. Co., Inc., describes the company's line of directional signals, advance warnings, road construction approach warnings, guide and regulatory signs, barricade strips, and delineator strips.

According to the company, its products adhere to the "Manual on Uniform Traffic Control Devices for Streets and Highways" as far as colors are concerned.

To obtain Form No. 9356 write to Grote Mfg. Co., Inc., Grote Square, Bellevue, Ky., or use the Request Card at page 18. Circle No. 114.

...For Real Protection against Shaft Leakage..."



CARVER PUMPS

...with grease-lubricated mechanical seals ...are your best guarantee for lightning fast prime, outstanding performance and minimum operating costs.



CARVER PUMP CO., 1404 Hershey Ave., Muscatine, Iowa

The quality name in pumps

For more facts, use Reader-Reply Card opposite page 18 and circle No. 412

NOW! Cure Concrete a Full Week Faster with FULCO Concrete Curing Mats



Can be Re-Used Up to 75 times!

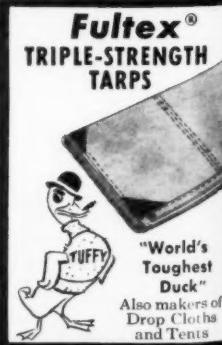
No more waiting 10 long days to set concrete with wet-burlap-wet-earth method. No more tying up of costly materials. Fulco does the job in 3 days flat! Does it better, too? Fulco Mats stay wetter longer and with less water. They increase the compressive strength of concrete, insulate against sudden temperature changes to produce a more uniform job. And because they can be re-used so often, they cut cost-per-job to the bone.

See your equipment dealer or contact
your nearest Fulco Branch today.



ATLANTA • CHICAGO • DALLAS • DENVER • KANSAS CITY • LOS ANGELES
MINNEAPOLIS • NEW ORLEANS • NEW YORK • OKLAHOMA CITY • PHOENIX
ST. LOUIS • SAN FRANCISCO • SAVANNAH

For more facts, use Reader-Reply Card opposite page 18 and circle No. 413



CONTRACTORS AND ENGINEERS

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The most expensive mile of highway on earth, being built at a cost of about \$8,700 per foot, is part of the inner belt in Boston, Mass. The Worthington Hi-Up truck mixers are delivering concrete to the tunnel section which, measuring 91½ feet from wall to wall, is the largest in the world.



Backfilling around a manhole is only one of the jobs of this International Drott TD-9 Skid-Shovel during construction of a sanitary sewer project in the Harbor Hill subdivision project in Port Washington, Long Island, N. Y. The rig also helped clear the right-of-way and excavate trenches.

Structural analysis topic of new college textbook

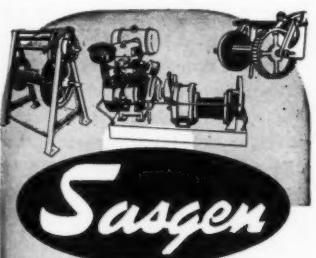
"Elementary Theory of Structures", by Chu-Kia Wang and Clarence L. Eckel, presents the essential principles of structural analysis in a first course for architectural and civil engineering students.

The text covers algebraic and graphic methods of solving problems in equilibrium of coplanar force systems; shear and bending moment in beams; stresses in trusses; influence diagrams; and deflections of beams, rigid frames, and trusses.

A list of problems appears at the end of each chapter. Graphs, diagrams, formulas, tables, and charts supplement written material.

Priced at \$7.50, the book may be purchased from the publisher, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.

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APRIL, 1957

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The first group of proposed amendments to the 10-year-old Taft-Hartley Act endorsed by unions and management alike was disclosed by Labor Secretary James Mitchell during the opening session of the AFL-CIO Building Trades Department's four-day legislative conference in Washington, D. C., recently. The amendments were the result of seven months of continuous meetings on the part of President Eisenhower's Joint Construction Advisory Committee on Changes in the Taft Act.

Out of the committee's discussions

came three major points of agreement: (1) The Act should be amended to legalize pre-hire agreements between contractors and building trades unions, (2) it should be amended to validate jointly administered apprenticeship funds, and (3) The Act's definition of "employer" should be amended to include a group of employers who have banded together voluntarily for the purposes of collective bargaining.

A detailed explanation of what the proposed amendments would mean if adopted by Congress was presented

by Louis Sherman, general counsel for the International Brotherhood of Electrical Workers. He began with a discussion of apprenticeship and training, stating that Section 302 of the Act now "casts a cloud of criminality" over the growing number of jointly financed and administered programs.

Section 302 makes it unlawful for any employer to pay money to a union unless the payments are for certain stated purposes, such as joint trust funds for retirement or health in-

surance. Apprenticeship and training funds are not among such purposes.

Sherman commented: "I believe that the absolute limit of absurdity is reached when one Federal law puts bona fide representatives of management and labor in jeopardy of criminal prosecution for promoting the apprenticeship programs which are desired by the public and which are supported by another Federal law."

Equally absurd in Sherman's eyes is the Act's ban on pre-hire contracts. He noted that the NLRB's present General Counsel will not initiate cases involving pre-hire construction agreements, so the Board cannot apply the law. But, he pointed out, the situation is such that "The entire fate of the building and construction industry is dependent on the will of the single individual who happens to be General Counsel of the NLRB at a particular time."

Under the proposed amendment, a building trades union could be certified by the NLRB without an election if the union filed a joint petition with a contractor under the following conditions: (1) There is a current collective bargaining agreement between the employer and the union, (2) there is a prior history of collective bargaining between such employer and union, and (3) the union has complied with the non-communist affidavit and financial registration provisions of the Act.

Sherman pointed out that the certification without election would not apply if any employee or group of employees allege, and the Board finds that a substantial number of employees presently employed in the bargaining unit assert, that the labor union is not the majority representative of the employees as defined in Section 9(a) of the Act.

"The enactment of this provision of the legislative proposal will permit labor and management to make valid and legal pre-hire agreements," Sherman said. "It is also anticipated that such enactment will also give the building trades unions the advantages which may result from Board certification. These include:

(1) Employees will be placed under a legal duty to recognize and bargain with the certified union;

(2) rival unions will not be able to seek recognition from an employer bound by such certification;

(3) a jurisdictional strike, otherwise illegal, may become legal if it is in support of the certification."

Multi-employer bargaining, as clarified in the third proposed amendment, does nothing more than restate the present law according to Sherman. It has long been the accepted practice in the building trades, recognized by the NLRB and a number of U. S. Courts. Although the amendment would eliminate any question of the legality of association-wide



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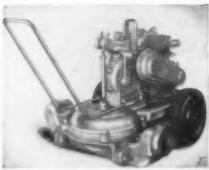
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lockouts, Sherman said, "The agreement by labor to the clarifying definition of the term 'employer' was not thought to be too great a concession in return for the agreement expressed by management with the other items in the legislative proposal."

If the speeches of the members of Congress who spoke at the building trades meeting is any indication, the proposed amendments will be received very favorably when the Administration sends them to Capitol Hill. Congressman Frank Thompson (D-N.J.) a member of the House Labor Committee, said that amending the Act will be his committee's first order of business. The Administration proposals will get through, he assured the conference delegates.

On the other side of the aisle, Congressman William Bray (R-Ind.) put himself on record as "happy to support" the three amendments. Congressman Samuel McConnell (R-Pa.) concurred with him.

Support is also promised from the Senate. Thomas Kuchel (R-Calif.) gave his backing to the amendments and Patrick McNamara (D-Mich.) advised the delegates to "put the pressure on the Administration to follow through, for once and for all, on its annual recommendations" on Taft-Hartley.

While the Taft-Hartley amendments appear to be running along a smooth road, that part of the Building Trades Department's legislative program calling for a broadening of the Davis-Bacon prevailing wage act so that it will apply to all Federally assisted construction in excess of \$2,000 seems likely to have considerably rougher going.

Sen. Kuchel went only as far as to say he would support such a measure "in principle." Other speakers limited their endorsement to the implication that they would be in favor of extending Davis-Bacon.

NSPE opposes BPR employment clause

The board of directors of the National Society of Professional Engineers has opposed a recent Bureau of Public Roads recommendation regarding the employment of engineers on federal-aid highway projects. The Bureau's recommended clause stated that state highway construction contracts would forbid a consulting engineering firm to engage any professional or technical personnel who are or have been, during the period of the contract, employees of the Bureau or of state, county, or city highway departments.

The board approved a report of the NSPE engineering practices committee that stated that such a policy would have the effect of "freezing highway department employees to their jobs or forcing them out of the highway program entirely".

LEAVING A RIBBON OF CONCRETE behind it, the paving spread of S. J. Groves & Sons Co., Minneapolis, Minn., presses forward to complete Contract Section 19 on the Northern Indiana Toll Road near La Porte. Welded wire reinforcement is being placed over the first 7 inches of concrete. An additional 3 inches brings the slab to a 10-inch depth.



Ideal for work in close quarters on housing project

The city of Calgary, Alberta, is building a system of city lanes (alleys) in an area of new homes on the west side of the city. To handle the necessary earthmoving, the city rented two D Tournapulls — one from A. Baldwin, the other from Jefferies and Sons Ltd. Tournapulls worked under the supervision of the City Engineering Department.

Build "T" shaped lanes

On the day photographs were taken, each Tournapull was building a "T" shaped lane (alley). Tournapulls self-loaded up to 5 pay-yards of gravel and sandy silt — working either across top of "T", or up stem. When excavating up stem, "D" starts cut toward lane intersection... continues to load right up to, during, and after making 90° turn... completes right-angle cut on lane across top of "T". Continuous loading reduces cycle time... moves more yards per hour... completes job sooner.

Low land brought up to housing grades

Tournapulls hauled material to nearby gully, where it was spread to bring up lowland to housing grades. "The 'D' is ideal for this kind of work," says operator Neil Lauchlin. "You can really maneuver around these tight spots. It's good and fast, too!"

Turns 180° in 24'3"

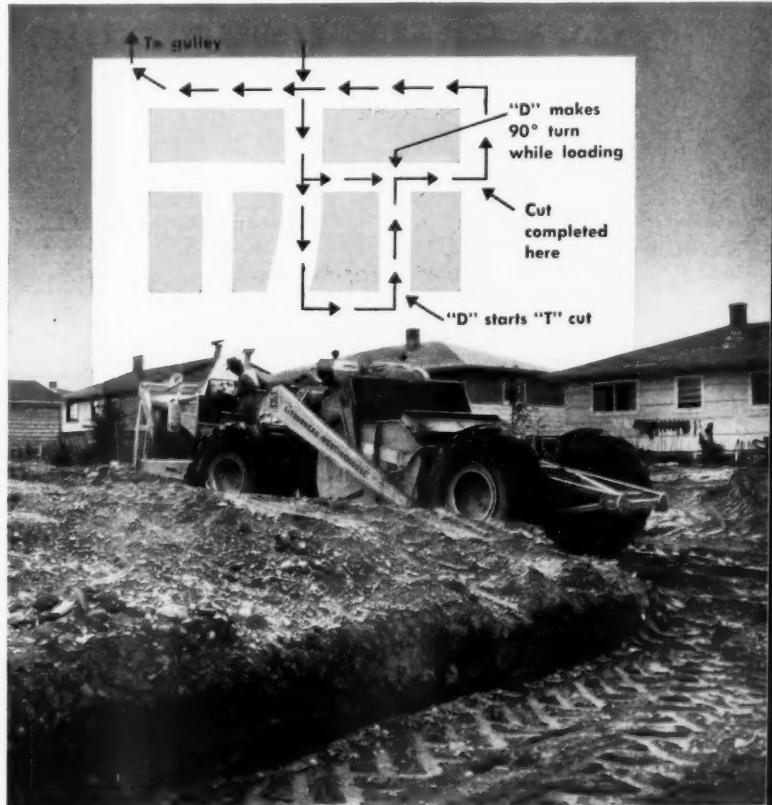
Tournapull's positive electric kingpin power steer enables rig to turn around non-stop in an area only

Loading in restricted quarters, D Tournapull negotiates sharp 90° loading turn — self-loads up to 5 pay-yards of gravel and sandy silt, grading for Alberta City lanes. Electric motors accurately control scraper blade, apron and tailgate as well as kingpin steer.

pull swings into cut position quickly. If pusher is used, it need not sit idle while scraper operator wastes time on a wide sweeping turn, and then on long, slow back-in.

Investigate today

Check the new improved D Tournapull. Find out what its short turn radius and high speeds can do for you. New "D" now gives you 9 cu. yds. heaped capacity. With 8' wide road clearance and axle-load within 9-ton limit, rig can be roaded almost anywhere without special permit. Send for complete details.



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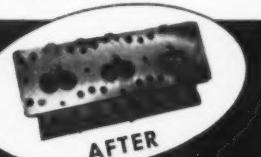


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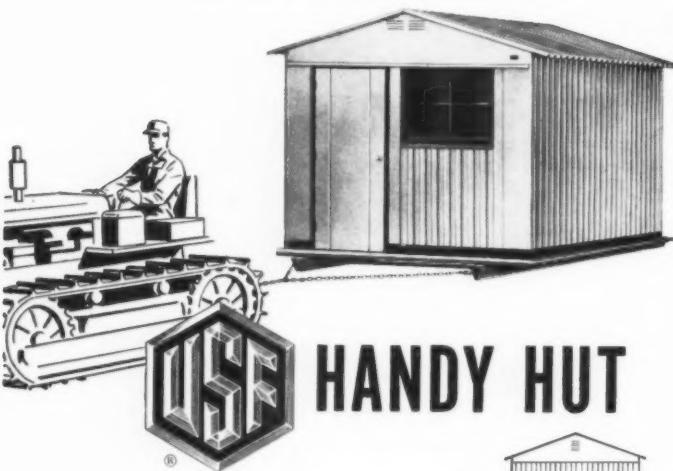
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to the next job



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New USF booklet gives complete information on Handy-Hut sizes, sash and door combinations, and optional equipment available. Allows you to plan a special USF Handy-Hut to suit your exact purpose. Free copies mailed immediately upon request. Write . . .



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The lighter side

For a moment we thought a new construction magazine had hit the newsstands when we spotted the cover of what turned out to be the March 9th issue of the Saturday Evening Post. Its "Coffee Break at the Cofferdam" scene looked realistic . . . even if the forming technique for the concrete pier is unusual.

William Hazlett Upson, whose stories about Alexander Botts, Earthworm Tractor salesman, have long delighted Post readers, is now having his tall tales put on film for TV viewing next fall. The National Broadcasting Company is filming the half-hour series with comedian Don Adams in the role of the tractor salesman who turns in such interesting reports to his boss.



C. M. Stanley, a global thinker and author as well as a business man.

Another literary sidelight, on the serious side this time, is the new

book "Waging Peace" just published by The MacMillan Co. Its author, C. M. Stanley of Muscatine, Iowa, is the president of Prime-Mover Co., a manufacturer of motorized material-handling equipment, and the senior partner of Stanley Engineering Co., consulting engineers. Subtitled "A business man looks at foreign policy", the book treats of international relations. For the past two years the business man-author served as national president of United World Federalists, and is currently head of the organization's executive council.

• •

You free lance inventors put on your thinking caps. The National Inventors Council, U. S. Department of Commerce, has several "blue sky" problems it would like solved for the good of the armed services, among them the development of a universal track. This would be a new method of traction that land vehicles might use on all types of terrain. Seems that the present steel tank tracks wreck paved roads. A "blue sky" problem, according to John C. Green, director of the Office of Technical Services and the Council's executive director, takes "imaginative, sky-is-the-limit thinking to solve it. The man who cracks one of these puzzles won't be bound by traditional barriers between sciences. He may have to be the modern equivalent of an Edison or Marconi—or even a Houdini." Let's try paging that fellow who invented the wheel.

• •

Incidental Intelligence: The Navy Board of U. S. Civil Service Examiners announces "Travel to the Pacific.

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800 WATTS
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These rugged, heavy-duty 3-wheel dollies are used as a permanent mounting for 3, 4, and 5 KW electric plants where portability is desired by contractors, bridge builders, mine operators, road constructors, railroads, cities and municipalities.

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Career Opportunities for Engineers
the junior engineer requiring a degree in engineering, is Force post that with "fashion clothes give advice post exchange clothes.

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• •

In 1911 Ragnar Benson came to this country from Sweden at the age of 12. He worked as a bricklayer's helper for \$5 a week, then became a journeyman bricklayer, later a masonry foreman, and in 1922 started on his own as a masonry contractor in Chicago. He now heads Ragnar Benson, Inc., a Chicago company with construction contracts that last year totaled more than \$80 million and employed 1,200 persons. Benson has chartered a Scandinavian Airlines System plane to fly a private party of 69 to Sweden as his guests for a 20-day visit. The DC-6 will leave O'Hare International Airport on



When he came to America, Ragnar Benson could speak only Swedish.

April 14 for Malmo, Sweden. Malmo is 75 miles from Benson's native town of Almhult. The plane will return to Chicago May 6.

Of the 69 making the trip, 34 are of the Benson clan, 33 are company employees and their families, while two other passengers, old friends of Ragnar, are a minister and his wife. Now 57, Benson is making the trip he says

because "for many years it has been my dream that some day I would be able to show my gratitude to the people who were so kind to me when as a boy of 12 I came to this country." The trip will cover 9,000 miles, and will cost the 250-pound contractor about \$50,000, including food and lodging.

• •

Say it isn't so, Virginia. The Highway Department of the Old Dominion proposes to enlarge a 9-mile stretch of route 29-211 between Gainesville and Centreville into a federal freeway. In the process it would cut a 250-foot swath, two miles long, through the heart of Manassas Battlefield National Park, and would level Henry Hill, the site of a strategic gun emplacement at both battles of Manassas. It was at Henry Hill Gen. "Stonewall" Jackson came by his famous nickname.

• •

A happy grading contractor is Dale Bennett, partner in Bee & Dee, La

(Continued on next page)

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Full-Shift COMFORT . . .

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Full-Shift PROTECTION . . .

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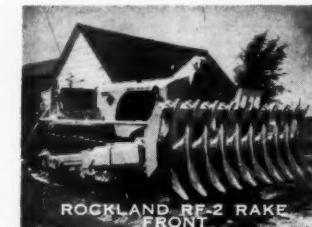
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A clear liquid which penetrates 1" or more into
concrete, brick, stucco, etc., seals—hold 1250 lbs.
per sq. ft. hydrostatic pressure. Cuts costs. Applied
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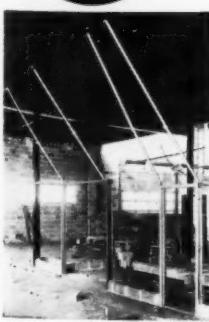
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and SPRING-TYPE**

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Excellent tool for use also in truing operations in construction work, road and bridge building, steel erection.



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SIZES
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1 1/2"
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SPECIAL CONSTRUCTION MODEL HAS 20" BARREL, 18" TAKE-UP

(Continued from preceding page)



Road Show prize—a Williams 3/4-yard clamshell bucket—goes to Dale Bennett, partner in Bee & Dee, La Porte, Ind. James A. Westlund, of the Wellman Engineering Co., Cleveland, made the presentation.

Forte, Indiana, who was picked in a drawing for a Williams 3/4-yard clamshell bucket as the lucky registrant at the Williams booth at the recent ARBA Road Show. The chance to win the bucket was open to all contractors who own a crane suitable for clamshell or dragline bucket operation, and who registered at the Williams booth. The drawing was held in the Chicago offices of The Wellman Engineering Co. following the close of the Road Show.

• •

The St. Lawrence Seaway project is establishing a noteworthy safety record according to Employers Mutuals of Wausau, a firm that is in-

suring seaway projects amounting to nearly \$60 million. The Wisconsin firm has a construction safety engineer, Otto Holmskog, who spends all his time at three key projects on the American side of the St. Lawrence near Massena, N. Y.—the Grasse River Lock, Eisenhower Lock, and Long Sault canal between the locks.

Holmskog says that 25 years ago the construction industry could expect to suffer one fatality per \$1,000,000 of construction. To date, contractors on the Seaway Project insured by Employers Mutuals have not had a single fatality. He attributes this to improved safety controls, more adequate safety training, together with far-sighted planning and excellent

supervision.

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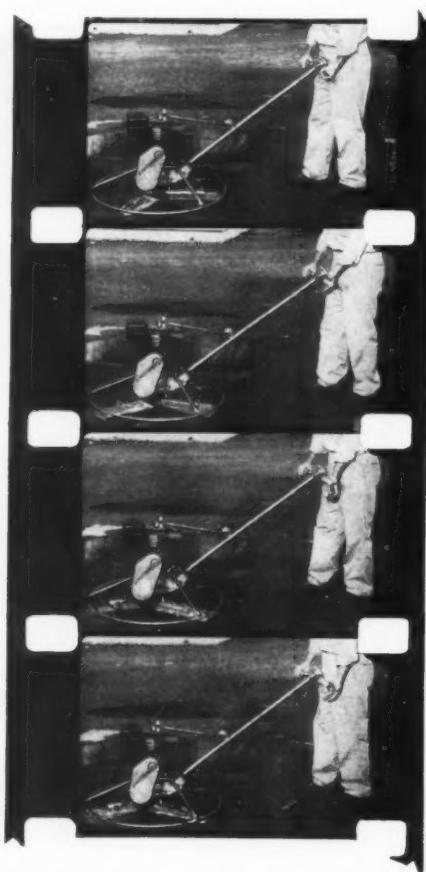
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A TROWEL BLADES IN MOTION

B CLUTCH CONTROL ON HANDLE IS RELEASED (NOTICE OPERATOR'S LEFT HAND)

C WITHIN 1/4 TURN, OR 1/6 OF A SECOND, THE BLADES ARE COMPLETELY STOPPED



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Close up of manually actuated clutch control which stops blade rotation within 1/6 second, when handle is released.



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194

ALL-HYDRAULIC!

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KRANE-KAR

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Boom Swinging
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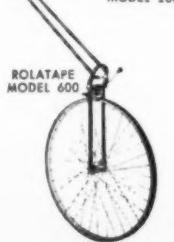
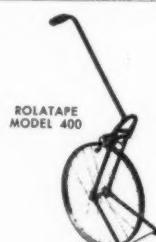
Originator and leader in its class for 30 years, KRANE KAR goes ALL-HYDRAULIC. Affords amazing ease of handling... touch control of all crane operations . . . with other engineering advances that simplify operator's work . . . eliminating gear shifting and clutch replacements . . . cutting maintenance to the bone and setting new standards of efficiency and productivity. Get the details. Write, wire, telephone today.

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Pioneer Mfrs. of Heavy Duty Materials Handling Equipment
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ROLATAPE is the Fast, Efficient, Economical, Modern way to measure. Model #400 is widely used by Road Construction Companies, Telephone Companies, Utilities, Sewage Departments and many other industries where measurements are important.

MEASURING time is cut to a fraction with ROLATAPE. Model #200 is extremely popular with Real Estate Men, Appraisers, Traffic Officers and many others who demand fast, accurate, measurements.

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ROLATAPE, INC.

Factory: 1741 Fourteenth Street, Santa Monica, California

CONTRACTORS AND ENGINEERS

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50

APRIL

supervision in effect on the Seaway Project.

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According to Dr. F. T. Mavis, Head of the Civil Engineering Department at Carnegie Institute of Technology in Pittsburgh, the Pennsylvania State Highway Department is seeking 1,500 engineers and engineer assistants.

"This figure," Dr. Mavis says, "is almost INFINITE when one realizes that there will be only 3,800 civil engineering graduates in the entire United States this June. At Carnegie Tech last year only 43 students graduated from the Civil Engineering Department. Opportunities for civil engineers are the brightest they have ever been."

Flashing device fits top of traffic cone

A traffic cone safety flashing device designed to extend traffic cone utility to after-dark application is available from the Belltron Mfg. Co. The device is 13 inches tall and fits snugly into the top of a standard traffic cone.

The light extends 2 inches above the top of the cone and is said to be visible in darkness at a distance of 400 feet. A bi-metallic flashing element is incorporated within the bulb and flicks on and off at two-second intervals. Operating current is provided by four standard flashlight batteries.

series from which 108 hours of continuous operation may be obtained, the company states.

The entire unit is welded except for the switch assembly, which is riveted for greater elasticity of construction. Because the case acts as the ground, operation of the flashing device is not affected by inclement weather.

For further information write to the Belltron Mfg. Co., 545 Hoover Ave., Bloomfield, N.J., or use the Request Card that is bound in at page 18. Circle No. 124.

New heavy-duty hose for pneumatic drills

A new hose for pneumatic drills has been developed by Hewitt-Robins, Inc., for heavy-duty use in quarries, road construction, and other types of service requiring a hose that is tough, yet light, flexible, and easy to handle, the company announces.

The hose has been designated Dur-oil air drill hose. It contains a Buna N tube, resistant to oil and oil vapors, a braided rayon cord carcass which will not contract, elongate or "fight back" under working pressures; and

a cover of natural rubber having a tensile strength in excess of 2,000 psi.

The hose is capable of resisting the tearing, gouging, and impact abuses common to air drill service, according to the company. It is available in 500-foot reels in diameters of $\frac{1}{2}$, $\frac{3}{4}$, and 1 inch.

For further information write to Hewitt-Robins, Inc., 666 Glenbrook Road, Stamford, Conn., or use the Request Card at page 18. Circle No. 144.

Goodyear honors Carter for long record of service

The Goodyear Tire & Rubber Co., Akron, Ohio, has honored F. J. Carter for 35 years of continuous service. Carter, vice president in charge of in-

dustrial relations, started with the firm as a tire builder. Since then he has held various managerial positions in the firm's foreign and home offices.

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Leather Covers
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EXTRA LONG WEAR

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- UNIFORM STRESS PREVENTS TEARING

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The everlasting choice in long steel tapes! Handsome, top-quality, leather case is hand-stitched over rust-resisting metal liner. Hand-stitching ensures a better, longer wearing outside cover. Exclusive Chrome Clad line is rust and corrosion resistant—will not chip, crack or peel. Bold black markings can't wear off. 25-50-75-100 foot lengths.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 430

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TAPES • RULES
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FROM YOUR SUPPLY STORE

THE LUFKIN RULE COMPANY
SAGINAW, MICHIGAN

400 RULER MEASURE WITH

SWENSON SPREADERS Speed Sealcoating!

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for DUST CONTROL or
SOIL STABILIZATION

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information
SWENSON SPREADER
& MFG. CO.
Lindenwood, Illinois



For more facts, use Reader-Reply Card opposite page 18 and circle No. 431

"WE'RE TURNING OUT
THE FINEST MATERIAL
IN TEXAS!

... Plant Is Operating Beautifully!"

Says Bill Boorhem, Production Manager of Wesco Materials Corp., Dallas, Texas, whose New Circle #1 Plant is their Second to be equipped with EAGLE Washing-Classifying-Dehydrating Equipment!

Yes, when a successful firm like Wesco installs a second round of Eagle Equipment at a new plant you can be sure they are right and that the equipment is right.

The Eagle Complete Washing-Classifying-Dehydrating Section at Wesco's Circle #1 Plant consists of a 20' Water Scalping-Classifying Tank with power-operated bleeder valves and triple compartment collecting-blending flume, a 36" dia. x 25' Double Screw Fine Material Washer-Classifier - Dehydrator and a 36" dia. x 25' Single Screw unit, producing concrete sand and mason sand. A 36" dia. x 30' Log Washer processes gravel for specification aggregate. Output averages 2500 yds. per day.

46% of Eagle installations are re-orders by satisfied customers. Plan your first installation today! Reap the benefit of Eagle's field experience and specialized engineering services.

Send for your copy of Catalog 55

EXPERIENCE, PROGRESS, SERVICE, SINCE 1872

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159 HOLCOMB AVE., DES MOINES, IOWA



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JOINT SAWING MACHINE

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by HUBERT KELLEY, JR.

The critical shortage of engineers and scientists prompted two Minnesota Republicans—Sen. Edward J. Thye and Rep. Walter Judd—to form resolutions setting up a joint House-Senate committee to find ways to overcome the deficiency. The committee, consisting of eight members from each chamber, would be given authority to study the manpower needs in this area.

"The issue before us is unmistakably clear," Judd says. "We must overcome the shortage of scientists

and engineers if we are to ensure our security as a free nation and at the same time continue our economic progress."

He points out that in the past five years Russia has turned out an estimated 216,000 engineers, compared to our 142,000. As against the Soviet's 30 per cent, he adds, only 8 per cent of our college students are in engineering.

The lawmaker states that if U. S. living standards are to show continued improvement, labor produc-

tivity must be boosted even faster. "It is primarily to the scientists and engineers that we must look for help in accomplishing this objective."

The big housing fight in Congress has shifted direction. Last year the issue was public construction and Congress authorized the building of 35,000 public housing units for this year and next; now the issue is "tight money."

The administration, recognizing that housing is the hardest hit by

tight money, wants down payments cut on moderate-cost homes bought with mortgages insured by the Federal Housing Administration. This, it is felt, will help speed up lagging home construction by easing the cost impact on house buying in the \$12,000 or more price range.

Specifically, Housing Administrator Albert M. Cole recommends legislation to reduce downpayments on FHA homes to 4 per cent on the first \$10,000 of appraised value; 15 per cent on the valuation between \$10,000 and \$16,000; and 30 per cent on the valuation between \$16,000 and \$20,000 the loan ceiling.

Under the present law, he cannot slice down payments below 5 per cent on the first \$9,000 and 25 per cent on the excess up to \$20,000. The repayment time limit of 30 years will not be changed.

Cole says this payment liberalization would help offset effects on the housing industry and general economy of the GI home loan program for World War II veterans that is scheduled to end in July, 1958.

The administrator also proposes that the FHA military housing insurance program be extended to June 30, 1959, and that the eligible bid on a military housing project bear a "reasonable relation" to FHA's replacement cost estimate, rather than be equal to it or under it.

One of the side battles involves the timing of FHA downpayment reductions, should FHA get this authority. Cole would have the discretion of deciding when the cuts would be made and said he would prefer to wait and make them when the non-urban GI loan program expires. This immediately drew criticism from the housing industry, key lawmakers, and others who feel that if reductions are authorized they should be put into effect immediately. The act-now camp on Capitol Hill includes Rep. Albert Rains (D.—Ala.), who heads the House's housing subcommittee.

Sen. John Sparkman (D.—Ala.), chairman of the Senate's housing subcommittee, expressed doubt about the wisdom of immediate down payment cuts, but wanted more information on the housing situation before committing himself.

Caught in the crossfire, Cole made some hasty reservations. He said that if the reductions were authorized by Congress he might put them into effect before the GI loan program expired, if economic conditions warranted. Going further, he declared he might invoke "immediate" reductions if Congress did not follow the administration's recommendations and boost the interest rates on GI home loans from 4½ to 5 per cent. His position was that such a step is absolutely necessary to make it easier for veterans to get the mortgage funds they need.

CONTRACTORS AND ENGINEERS



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The early returns on this issue were not encouraging. The House Veterans Affairs Committee voted down the proposed interest rate increase. Instead the committee reported out a bill providing \$200 million to extend the direct loan program till July, 1958, and increasing the maximum loan limit from \$10,000 to \$12,500.

Less in doubt was the issue of whether over \$1 billion of the National Service Life Insurance reserve fund should be used to expand the Veterans Administration's home loan program for GIs. There was not as much protest when the Veterans Affairs Committee vetoed this idea, but supporters vowed they were not giving up.

The FHA downpayment question dominated all others in controversy. One reason was the Federal Reserve Board's exception to the administration position that reductions are desirable. Winfield W. Riefler, assistant to FRB chairman William McChesney Martin, Jr., testified before Congressman Rains' housing subcommittee that he thought present FHA payment terms were reasonable in keeping housing activity at a rate that is not inflationary but consistent with the general economic growth.

"The recent drop in new mortgage commitments is concentrated almost wholly in the federally-sponsored home mortgage insurance and guarantee programs which involve a minimum of risk to the lender," Riefler said. "The volume of funds flowing into conventional home mortgage financing, where the lender assumes all the risk, has not diminished."

The FRB official expressed concern over a policy calling for lowered downpayments in a time of prosperity when, he said, people should be encouraged to save in order to curb inflationary pressures. He added that consumers these days can well afford to meet FHA's present "moderate" home loan terms.

An entirely different view was put forth by the National Association of Home Builders, which said the administration was "not going far enough or fast enough with its proposals to counteract the slump in home building." NAHB president George S. Goodyear testified that a further drop in home construction is in the offing this spring and summer. Unless adequate steps are taken quickly, "it will soon be impossible for us to continue to build American homes of the kind, and in the volume, the American people demand and need."

Goodyear contended the downpayment required on FHA-insured homes "is too high for the typical purchaser at today's construction cost levels." He said a purchaser of a \$15,000 house, for example, must put down

around \$2,400—a sum few prospects for dwellings in this price range have in loose cash.

He said FHA's downpayment schedule, designed for a time when the value of a typical new home was \$8,200, is now "outmoded" because

the median value has jumped to around \$12,500.

The NAHB spokesman, urging a hike in the interest rate on GI loans to 5 per cent, stated that these loans "have become practically non-existent, except at prohibitive discounts

which in many cases now equal or exceed the builder's profit margin."

He said the "large and steady" demand for low and medium-price homes cannot be met unless the practice of mass financing is revived.

THE END



BEAR IN THE BORROW PIT

THIS D9 LOADS SCRAPERS WITH 25 HEAPED YARDS IN 45 SECONDS



Phil Dudenhoefer, grade superintendent, knows from production charts that the D9 pusher loads more yards faster, at lower cost.

Working on a highway relocation job near Eau Claire, Wis., L. G. Arnold, Inc., cut cycle times and boosted yardage with a Caterpillar D9 Tractor push-loading a CAT* DW21 and No. 470 Lowbowl Scraper.

On a round-trip haul of 3 miles they averaged 100 cu. yd. per hour—4 heaped loads of 25 cu. yd. each. Loading time in the borrow pit, with the mighty D9 pushing, was an average of only 45 seconds.

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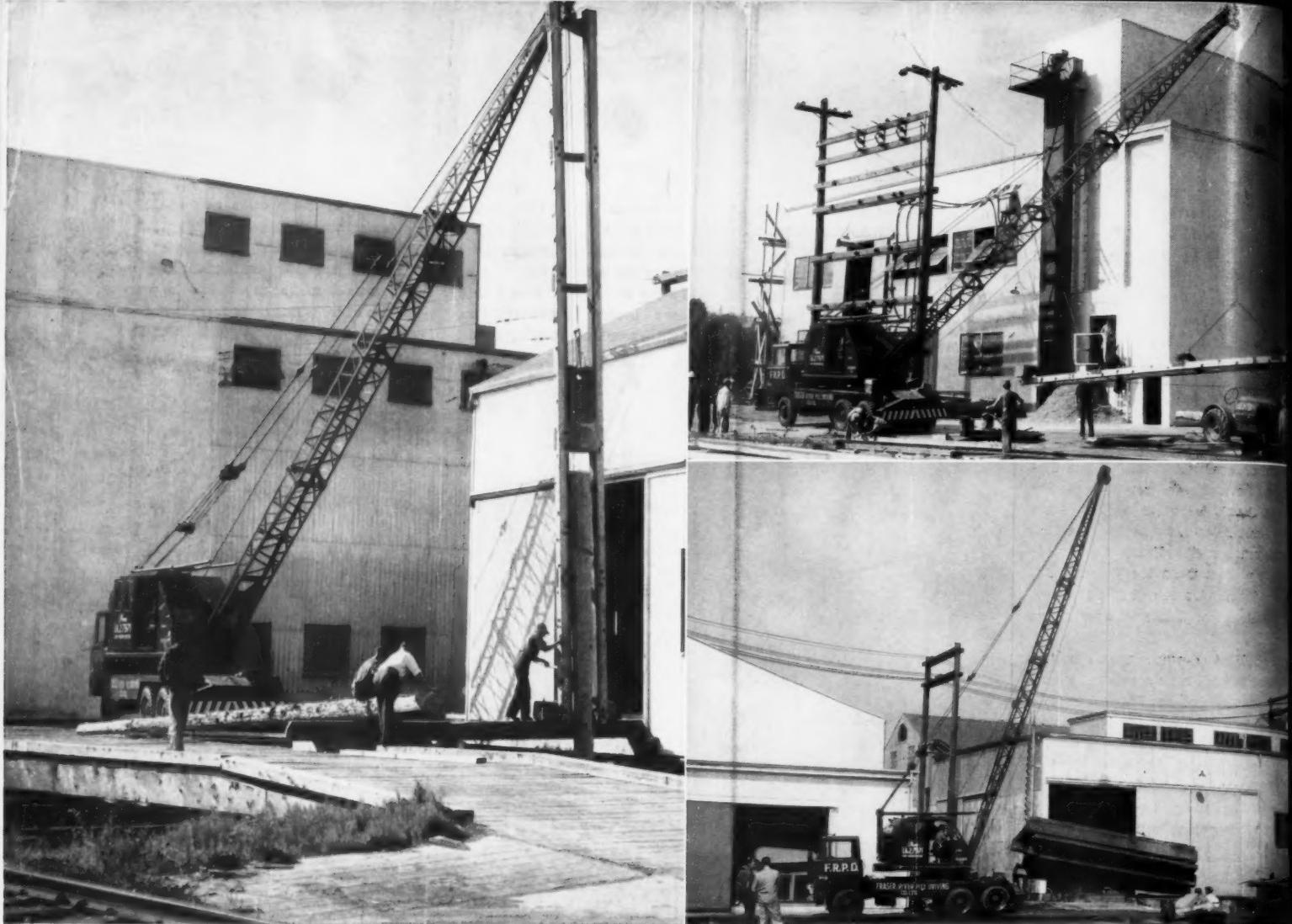
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Versatile Michigan 15-ton Truck Crane handles entire railroad trestle project —ALONE!

Michigan cranes are nothing new to Fraser River Pile Driving Company, Ltd. (New Westminster, British Columbia)—they've owned eight of them. Still, there's something pretty special about being able to say "Send a Michigan" . . . knowing this *one machine alone* can handle a crane or shovel job quickly, efficiently, *profitably*. A case in point is the railroad trestle Fraser built recently for Pacific Veneer Division of Canadian Forest Products, Limited.

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To get work started with minimum delay, Fraser's 15-ton Michigan truck crane was driven in to the job over main highways. Unit was light and

narrow enough to need no highway permit. Its first assignment was pile driving. A 35-foot tower was assembled to the boom end and raised into position; a 3600-pound hammer slammed dozens of pilings into place. Michigan's maneuverability really shone here, for it carried—and placed—all trestle timber and sections of pre-built bridge flooring, *as well as* the big pilings. And to finish matters, they later put a clamshell on the Michigan and cleaned up underneath the finished trestle.

"Very pleased with our 8 Michigans" says owner

It's easy to see why Fraser River Pile Driving Company has been "very pleased" with the performance of their

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